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# MOTOR AGE

Vol. XL  
Number 15

PUBLISHED WEEKLY AT THE MALLERS BUILDING  
CHICAGO, OCTOBER 13, 1921

Thirty-five Cents a Copy  
Three Dollars a Year



## **Champion** Dependable Primers

### Now is the time to sell Winter Equipment

Champion Primers make speedy work of starting cold engines.

A necessity for motorists who keep their cars in unheated quarters and for those whose business requires every day use.

See that Champion Primers are installed in your customers' cars early for their Fall and Winter driving.

**Champion Spark Plug Company**  
Toledo, Ohio

Thoma & Son, Inc., Fairfield, Iowa.

Gentlemen:

- ( ) Send us details of your A-L-T Sunbeam Visor Sales Plan, and your dealer proposition.  
 ( ) Send us samples of amber and green ribbed Pel-Lock glass used in A-L-T Sunbeam Visors.  
 ( ) Ship us.....Visors (amber)  
 ( ) Ship us.....Visors (green)

for .....  
 (name of car—open or closed model)

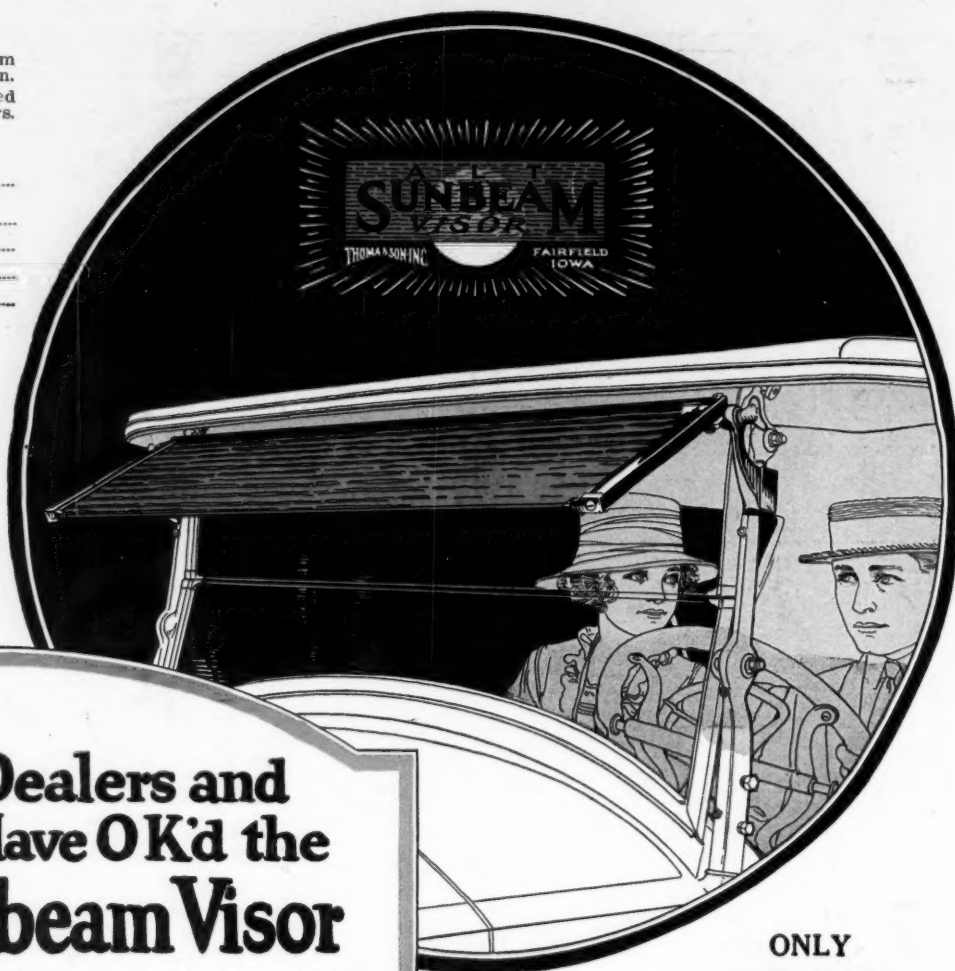
The Jobber through whom we buy is.....

Name .....

Address .....



Quarter inch ribbed Pel-Lock glass used in the A-L-T Sunbeam Visors. The color is in the glass—not flashed or stained. Made in amber and green.



## Jobbers, Dealers and Car Owners Have OK'd the A-L-T Sunbeam Visor

Never has an accessory leaped into popularity so quickly—and so permanently—with the entire automobile industry. Car owners have been quick to recognize it. The more progressive dealers in every locality have discovered this consumer "acceptance," and through our co-operative sales plan are building up a tremendously profitable business on it.

The A-L-T Sunbeam Visor has been placed in stock by many of America's leading jobbers. Here are a few of those from whom you can buy it:

Beckley-Ralston Co., Chicago  
 Automotive Specialty Co., Chicago  
 C. M. Hoof Co., Chicago  
 Campbell Iron Co., St. Louis  
 Simmons Hardware Co., St. Louis  
 Beck & Corbett Co., St. Louis  
 Paxton & Gallagher Co., Omaha  
 Master Sales Co., Omaha  
 Western Automobile Supply Co., Omaha

Reinhard Brothers, Minneapolis  
 Herring Motor Co., Des Moines  
 Robinson Heavy Hardware, St. Joseph  
 F. W. Heitmann Co., Boston  
 Julius J. Bantlin Co., Cincinnati  
 T. C. Esser Co., Milwaukee  
 Rayfield Sales Co., Indianapolis  
 Western Auto Supply Agency, Seattle  
 Justice & Parker Co., Columbus  
 Bellevue Mfg. Co., Bellevue, O.

If you do not buy from any of the above we will be glad to supply you through any jobber you may name. Every Visor packed in individual corrugated board shipping case—easy to handle or re-ship.

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A 7x10, 16-page Prospectus tells you how we're moving the Visors for our dealers—at our expense. The coupon or a letter will bring it. By all means *get the facts* about this money-making accessory.

**THOMA & SON-INC.**  
 Everything in  
 Glass for the Automobile  
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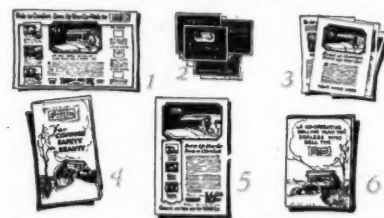
All castings of solid brass, heavily nickel-plated, rust-proof. The simplest, neatest and most practical hardware used in any Visor.

"A Christmas Gift for Dad"

ONLY  
**\$16<sup>00</sup>**

West of Rockies \$18.00

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- 5 A striking 3-color Poster for your window or wall.
- 6 These and other effective sales helps fully described and illustrated in a 32-page Prospectus—mailed free on request.



# MOTOR AGE

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## CONTENTS

Your Customers—Your Guests.....	7
The Man to Meet the Public—By B. M. Ikert.....	8
Gain Confidence of Customers by Taking Personal Interest in Them—By a Service Manager	10
Putting Class Into the Used Car Business.....	12
How Armature Growler Operates.....	14
Descriptions of the New Traffic "Speedboy" Bell, One-Ton Truck and Service Speed Truck	16
Small Cars Break Records Regularly in Europe..	18
Manufacturers at Last See Used Car as Their Problem .....	19
Editorials .....	20
<b>News of the Industry</b>	
Award Buick First Choice in New York, Chicago Shows	22
Early Fall Sales Point to Production in Easy Stride	22
Economical Operation Is Guide of French Designers	23
Solons Get Together on \$75,000 Highway Bill.....	23
Briscoe Motors Official Roster Carries New Names	24
France Closes Grand Prix to All But 112 Cu. In. Cars	24
Peerless and Collins Cars Both to Be Manufactured	25
Fisk Rubber Co. Gets Tire Contract for Durant Cars	25
New England Takes Lead in Uniform Vehicle Law Drive	26
Better Methods Paramount to Greater Business Volume	27
Dunkle Motors Co. Plans to Handle 12 Lines of Cars	29
Vehicle Shipments During September Decrease, 4 Per Cent .....	31
<b>The Readers' Clearing House—Questions and Answers—</b>	
Eliminating Harshness in Clutch Engagement.....	32
Calculating Gas and Steam Engine Horsepower.....	32
Changing Magneto from Six to Four-Cylinder Type.....	32
Speed Possibilities of Single and Double Carbureter.....	33
Equipping Old Car with Clutch Brake.....	33
Converting Dodge Into a Fast Speedster.....	33
Magnetos Not Demagnetized by Metal Coupling.....	34
Timing of Chevrolet 490.....	34
Highest Speed Made by Steam Car.....	34
Location of Brake on Borg & Beck Clutch.....	34
Thinks Engine Has Compression Knock.....	34
Where to Get Books on Electroplating.....	34
Care of Paint Brushes.....	35
Reader's Method of Eliminating Oil Pumping.....	35
Delco Starter-Generator Charging and Consumption Rates .....	35
Detecting Short-Circuited Series Fields.....	36
Differences in Bosch Magnetos.....	36
Bearings Used in New Buick Four.....	37
Where to Procure Various Wiring Diagrams.....	37
Repairing Scored Cylinders.....	37
Data on New Buick Four.....	37
<b>MYSTERY TALES</b>	
What Is Wrong with This Ignition System?.....	37
Another Explanation of Harry Grinnell's Ignition Mystery .....	37
Steering Gear Moves Throttle Control.....	37
Six-Cylinder Engine Knocks Out Bearings.....	37
<b>The Accessory Show Case.....</b>	38
<b>Service Equipment .....</b>	39
<b>Carbureter Equipment on 1921 Passenger Cars....</b>	40
<b>Some Timely Tips on Timers.....</b>	41
<b>Specifications of Passenger Cars and Trucks.....</b>	42
<b>Coming Motor Events.....</b>	46

Index to Advertisers Next to Last Page.

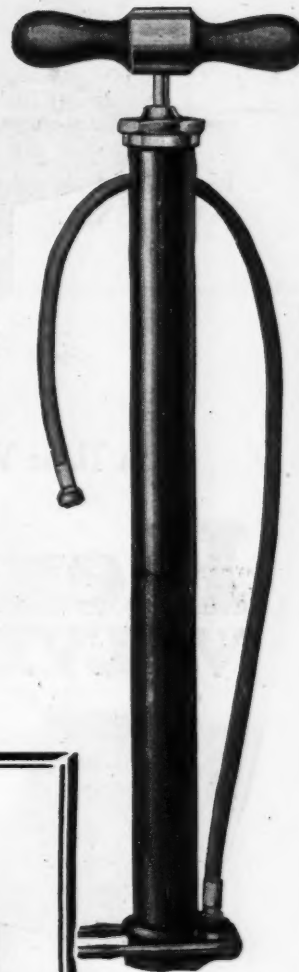
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## Here's a Pump that Sells —and Stays Sold

### And Here's Why

Down at the base of the MONROE plunger, located just above the valve leather, (as shown in the illustration below) is a felt washer. This washer is thoroughly soaked in a leather-preserving oil. On each up-stroke of the pump a little of this oil is released and is absorbed by the leather, keeping it so soft and pliant that it readily spreads on the slightest down motion of the plunger, completely filling the cylinder and preventing all possible chance of leakage. The full head of air is forced into the tire where it belongs. This feature has been the means of placing the MONROE in a large number of the foremost motor cars as standard equipment. It will sell just as readily in your store—AND STAY SOLD. For the MONROE never goes back on a user. Regardless of how long it has been out of use, it is ready the instant it's needed. Ask for details and prices.

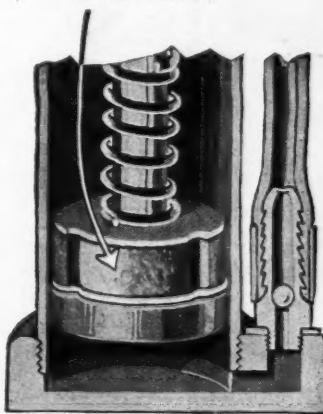


**Monroe Auto  
Equipment Mfg.  
Company**

**Monroe - Michigan**

**The Fulton Company**  
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### PATENTED SELF OILING WASHER



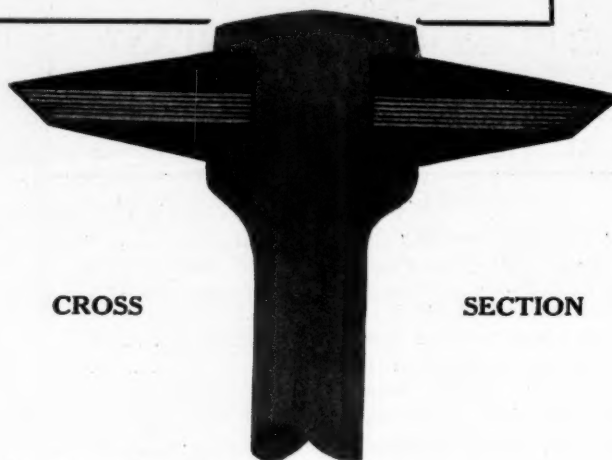
Makers  
also of  
Monroe  
Brake Shoes  
for Fords  
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and  
Closed Car  
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# M O N R O E

Self-Oiling

# T I R E P U M P

## Be a Valve Specialist



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SECTION

With These Valve Tools and Valves You Can Correct Any Case of Valve Trouble

### Flexedge VALVE TOOLS



A complete line of cutter heads, reamers and pilots with several exclusive features. Half of the teeth of the cutter heads are cut radial with the center and each intermediate tooth is nearly parallel to the one preceding it. All chatter is thus eliminated—an extremely important feature.

Perfect alignment of the angle cutter and pilot is another important feature.

Highest grade tool steel is used, hardened and tempered. All sizes—standard, standard oversizes and special. Sold in sets or individually. See your jobber or write for literature and complete information.

### Flexedge VALVES *You Never Need Grind*

In ordinary cases of carbon deposits Flexedge Valves correct the condition by cleaning the seat of carbon and keeping it clean. When the valve seat requires new cutting, the installation of Flexedge Valves will insure constant efficiency and eliminate compression losses.

Note the construction of the head. Instead of being one solid piece, it is made of laminations. When the head strikes the seat under the tremendous pressure that brings it down the edges of the laminations are flexed slightly (about 1/1000") which frees the seat of any carbon that has been deposited.

Use Flexedge Valves on every motor overhaul job and you will be insuring against compression leakage, fuel wastage and power loss. See your jobber or write for literature and complete information.

## SELF-SEATING VALVE COMPANY

340 W. Huron St., Chicago, Ill.



# MOTOR AGE

*Your Customers—Your Guests*



**M**ANY in the automotive service business have yet to learn how to sell their service properly to the customer.

It would not do to have the cook or dishwasher in a hotel dining room serve your food. Neither is it the right thing to expect automobile owners to be serviced by an individual whose clothes and mannerisms belong anywhere but at the point of contact with the customer.

Both the cook and the mechanic are essential individuals to their respective institutions. Their stations in life and in the business are as important as that of the hotel clerk or the new car salesman. But they should not go outside their sphere of activities. They are not the men to meet the public.



# The Man to Meet the Public

*Probably Most Important Man in Institution Is "Contact Man"—He Need Not Necessarily Be Endowed With Mechanical Ability—Must Know Customer's Likes and Dislikes*

By B. M. Ikert

**O**NE of the greatest factors in the selling of automotive service today is the man who makes the initial contact with the customer when he or she enters the service station.

The success of many service stations is due largely to the fact that this "contact" man has been properly chosen. Likewise, the failure of many service stations is due to the reverse conditions.

Of all the individuals connected with a service station, or, in fact, with the dealer's entire organization, sales and service, the contact man is probably the greatest salesman—at least, he is in the most strategic position to be such. Whether or not he takes advantage of this potential salesmanship depends largely upon the institution for which he is working and upon himself.

The dealer can do no better work than to make a study of his organization, with the prime motive of finding out who this contact man is, how he operates, and the reaction on the part of customers to the treatment received.

One thing has been proven long ago, and this is that the contact man does not necessarily have to be versed in the whys and wherefores of generators, rear axles or piston rings.

The mistake too often is made of putting a mechanic in as service salesman or service manager, and the result is a misfit. He knows how to set up a bearing and probably can fit a set of pistons and rings as well as the next man, but when he has to go outside of the immediate questions of the shop, he is lost.

He is not at home with the irate customer who comes in storming about the behavior of his car. He is not at home with the customer who does not want to pay the full price of a repair job. Nor does he know how to handle diplomatically the woman who brings around her coupe and who expects the service station to put itself out for her, free of charge, to "fix the engine so it won't jerk so."

The man who meets the customer is or should be, first of all, a salesman. He should possess those qualities which make it possible for him to get along with every class of customer. He may have to treat many of them with kid gloves. He will smile with some of them, and with others he simply has to talk "turkey."

Unless an institution has a contact man to organize the service in such a way that every customer who comes in will be given attention—at least be assured his wants will be taken care of shortly—the institution will suffer. The customer who has had to stand around waiting for someone to show up, gets mad and talks about "no system"—"got my money for the car and don't care

now"—"fine joint to drive into," etc. We do not have to go into detail on this matter. You probably have heard plenty of the same expressions.

It is not expected that a customer should be given immediate attention the moment he enters the service station. This cannot be done, and one of the things that goes with the efficient handling of any organization is delay. The fact that things are being done in an efficient way necessarily means delay. You stand in line at the bank window waiting your turn. There is delay, but you would not care to say that the bank was being run inefficiently.

Take a department store, for example. You enter, and the floor walker, the contact man, directs you to the counter at which you wish to make your purchase. There are other customers ahead of you and the clerk is busy waiting upon them. You are told by the floor walker to sit down for a few moments, and in time your turn comes to be waited upon. There has been delay, but not through inefficient handling of the business.

This item of delay in something which service stations have to impress upon their customers. The same customer who stands in line at the bank window gets mad when he has to wait for his bill in the service station. If he were properly sold on the place he would realize that there must be delay while proper records are made of the transactions. It should impress upon his mind the fact that he is doing business with an institution run as efficiently as a bank.

One of the faults of this business is that the contact man is too often a mechanic and, as such, cannot meet the public properly. We would not like, for instance, to go into a first-class hotel dining room and have the cook walk in and serve our food, however essential the cook may be in the preparation of the food. Similarly, many of your customers do not like to be met face to face by a mechanic seething in oil and grease. The mechanic is essential, but he is not essentially the man to meet the public.

In the larger service institutions there is little excuse for the absence of a "contact man," the same as there is little excuse for the absence of a floor walker in a large department store. In smaller organizations the contact man may have to be several other things, but he should first of all be on the alert to take care of customers' wishes.

Too often the procedure in a service station is as follows: a customer drives his car into the building and looks around for some place to stop. There is no one around to direct him, so he stops his car anywhere and gets out. He wanders around until he sees some men working on a car and asks for the service manager. "Right here," he is told, and out crawls the service manager from



The man to meet the public must be a salesman and a diplomat. If handled properly by the contact man, the customer will be made to feel that the institution is taking a personal interest in him. Customers will come to rely on him for all advice concerning their cars



under a car. There is nothing in his clothes that would distinguish him from the ordinary run of mechanics, but, anyway, he is the service manager and the one with whom the customer will have to deal.

He asks what's wrong with the car, and after the customer has explained as fully as he can what seems to be the difficulty with his car, the service manager calls over a helper and says, "Run this car around the block and see what's wrong."

Then the helper, who has been working on some sort of messy job, gets into the car in his dirty clothes and grips the wheel with his hands greasy from the previous job. Nothing is said to the customer as to whether he wishes to go along with the "inspector." He is not asked to sit down in the salesroom, nor to look over the line of accessories the dealer may have on display. The customer simply has to stand around and wait until his car comes back.

While he is waiting, he naturally has a chance to see what's going on around him. Maybe two mechanics are working on a job, and one of them cusses a part that will not readily go into place. The other mechanic says, "Aw, take a hammer and drive it in—what's the difference?" The chances are, by the time the customer's car is brought back he will be rather reluctant about leaving it, after the remarks he just has overheard directed against a repair job on some other customer's car. Why won't they use the same tactics on his car? What assurance

has he his car will be treated as a valuable piece of machinery? No one was anxious to wait upon him when he came in, and nobody seems excited about getting his business. They should worry about his car. If they don't work on his car, there will be somebody else's car.

Now let us see how this customer might be treated in a service station where they look upon him as their bread and butter; where a service salesman is placed to do nothing but watch out for the customer's interest, and where the men in the whole organization have been sold on the fact that "the customer must come first."

He drives his car into the station, as before. While still seated in the car, he is approached by a man who in a courteous manner asks him what he might do for him. The service salesman is aware that the customer wants something done to his car, or he would not have taken the trouble of driving into the service station. So, fortified with this knowledge, the service salesman invites the customer into the service manager's office for further consultation; or, if the conversation has disclosed the fact that the car should be taken out for an inspection, the customer is invited to sit down in the salesroom or rest room—if the building provides one.

The customer is informed that an inspector will report presently on the condition of his car, and the nature of the adjustment or repair needed. The customer may not even see the inspector take the car out. All he knows is that someone apparently well versed in the car is going to sift the trouble. And he feels perfectly at home in the salesroom or rest room.

After a short time the inspector, who, by the way, is not dressed in greasy overalls, lays down an inspection report to the service salesman waiting on the customer. On the report are various items checked O.K., while in a separate space, marked "Work necessary on this car," is written the following:

Timing chain needs adjustment.  
Bushings in front spring shackles.  
Valve tappets need adjusting.

The slip is not a repair order, but merely a memo showing the results of the inspector's work. A customer is pretty apt to be sold on the organization when he is handled in this



Care must be taken in choosing the contact man. The mechanic pictured above is far too young to inspire confidence. Car owners sometimes complain about having kids working on their cars or attending to them when they enter a service station

way. Even if everyone in the station were busy at the time he came in, the service salesman would see him, excuse himself a moment from the customer with whom he was dealing at the time, and inform the new customer that he would be right with him in a few minutes. And the customer, who is used to delay in the bank and in the drygoods store, will think nothing of it, providing he has been sold properly on the organization.

We have said the man to meet the public should not be a mechanic. This does not mean that he should not be versed in mechanical subjects. It is a decided asset to him and the organization if he knows the ins and outs of the car or cars sold and serviced in that institution. Some of the best service salesmen—in fact, some of the best new car salesmen—are those who have spent years in the shop, but who kept their eyes and ears open for opportunities, and, when the time came, were put in as salesmen.

Customers nowadays like to talk over mechanical details of a car, and the more intelligently a salesman or service salesman can answer their questions, the more apt they are to be sold on the car and the organization. Customers like to meet and talk with a service salesman like this, but they object to talking to a mechanic, dressed in greasy clothes, who cannot even talk good English.

Who meets your customers during the noon hour, when the men have knocked off for lunch? Do the mechanics or helpers gather around the entrance to the

building, smoking cigarettes, or is there a man on duty equivalent to the service salesman we have referred to in preceding paragraphs? You ask, "Why not let the men gather around the entrance and smoke?" Our answer is, "Have you ever seen the clerks in a drug store smoke during the noon hour?" How would you feel going into a bank at noon and finding the men gathering in groups and smoking cigarettes?

This is not intended to be a reform movement in any way. We are in sympathy with the men knocking off for lunch and smoking if they desire, but we do say it is not good business to do anything that might be the least offensive to customers conspicuously in their view.

The man to meet the public need only be an ordinary sort of individual who knows likes and dislikes.

The man to meet the public will strive to learn the names of his customers. It means more to the institution than if he strives to remember how much grease was put in the axle of a customer's car.

The man to meet the public will try to bid the customer goodbye when he drives out, having made sure that the latter has been properly taken care of. He will leave an impression with the customer whereby the latter feels the institution is taking a personal interest in him. The institution wants his business. Attention to the small details, like saying goodbye to the customer or reminding him that he might well have his radiator and water system checked over before the cold weather comes on, etc., are the things that a good contact man masters. He is the hitching post of the institution, and sooner or later customers rely upon him for almost anything.

Experience seems to show that the man to meet the public should not be too young. Preferably he is a man between 30 and 40, although we know of instances where successful service salesmen are below and above these ages. It is not uncommon to hear car owners complain of a service station because "they have a bunch of kids down there working on your car." For this reason, it makes a much better impression on a customer when a man whom years seem to indicate possesses pretty good judgment is placed at the point of contact with the customer.

# "Gain Confidence of Customers by Taking Personal Interest in Them"

*One Successful Service Manager's Method for Making His Department the Biggest Asset of His Employer*

*This Article Gives Some Practical Examples of How "THE MAN TO MEET THE PUBLIC" Can Build Good Will and Get Repeat Sales*

**E**DITOR, MOTOR AGE: I believe you have struck a fine idea in giving some of us service managers a chance to exchange our opinions and experiences through MOTOR AGE.

In my own opinion, service can be defined in two ways—what the service manager, or the dealer, thinks it ought to be, and what the customer thinks it should be. My idea is that service means prompt and courteous attention.

The customer should be received with a smile and a friendly word. Being able to call customers by name I find to be one of the greatest helps, because the customers all feel that you are taking a personal interest in their own particular car, and in their highest enjoyment of that car. If you don't remember their name they feel that you don't care whether the car is giving trouble or not, and that your only interest is to do the work and get rid of them.

Service, to me, does not mean how much a customer is to get for nothing, but how soon the machine can be put back into satisfactory working condition, at as small a cost as possible. A great many car owners imagine that service is what they can get free. But can anyone keep on believing that, if they will give the subject a little real thought? Not every customer can be handled in the same way, of course; but the average car owner can be gradually educated to take reasonable care of his car and thus avoid a great deal of needless repair expense, if the service manager has the right kind of knowledge of his own business, knows his customer fairly well and uses tact.

A good service department is one of the greatest assets a sales department can have. In fact, I can't see how a sales department could succeed without a good service department. There are always things that need adjusting, and the proper adjustment of a customer's car often proves to be also a successful adjustment of that customer's grievance against the car and the dealer that sold it to him.

When a service department is able to keep a customer's car running thousands of miles without unnecessary expense, the satisfaction resulting from such service means repeat sales. But if the car is not kept in good shape, the customer

The Service Manager speaks:

**Earl Schaffland**

*Service Manager for W. W. Barnett,  
Oldsmobile Distributor, Denver,  
Colorado*

is liable to look for another make of machine the next time he buys. Besides, there is always the influence of the customer over his friends who happen to be in the market for cars.

## SERVICE DEPARTMENT KNOWS WHEN NEW CAR IS NEEDED

By keeping in close touch with the service department, and cooperating with the service department, the sales department can generally find out when a man is in the market for a new machine, because it is the service department that always knows first when he feels that his machine is getting old or in bad shape because of hard usage.

While I try not to "butt in" on the affairs of the sales department, I do keep watch for remarks that might mean a "tip" for a prospective sale. And I believe that it would pay the average car salesman to "butt in" on the service department at least to the extent of asking enough questions and making enough observations to find out the real purpose of the service department, and incidentally to pick up valuable pointers about what kind of performance it is reasonable for people to expect from the car he is selling.

There isn't anything new about this idea. To my mind, it is merely a practical and sensible kind of teamwork. But there seems to be a tendency towards a policy of "everybody for himself" in a lot of business concerns today, and it wouldn't hurt even a star salesman to condescend to remember once in a while that his sales may be getting boosted along at least a little by somebody else in the organization, and that he might gain more help of this kind by keeping his eyes open for something besides prospective buyers. This is intended entirely as a suggestion, and not as a slam.

For my part, I find greater satisfac-

tion in my work when I go "nosing around" to see what is going on in other departments. It makes me feel more and more that I am a part of a smoothly working machine. No, this is not any cog-in-the-machinery idea, but rather a part-of-the-team idea.

Perhaps it would pay to relate a few experiences as illustrations of the fact that it pays to know your customers by name. Here is one that sticks in my memory. A tourist from Kansas City drove into our service station some time ago, and I called him by name as soon as he got out of his car. I also asked him what he had done with his old car—the one he had brought into our place the summer before. Of course, he told me all about how the car had behaved until he traded it in on a new one, how many miles he had driven it altogether, some of his most interesting experiences on one of his long tours in the mountains, and a lot of other things.

Then he asked rather suddenly, "But how did you happen to remember me? I haven't seen you since last year, and I had only a little work done then. You have so many regular customers to look after that it seems rather surprising that you should remember a stranger like me."

I told him that I didn't just happen to remember him, but that I had made it part of my business to remember him. "You owned one of our cars when you were here before, you are still driving one of the same make, and you have come here again for service. Why shouldn't I remember you? I am naturally interested in seeing that you get the right kind of service, because if I don't give you careful service and personal attention, you are liable to feel that we are merely trying to get your car repaired and out of the way, without any thought of your own interests and of the kind of a car you are likely to buy next time."

I could tell of dozens of cases similar to this, but it would merely take up extra time to hammer home the same point.

Besides knowing our customers personally, I also try to know a little something about their lines of business. We have doctors, lawyers, ministers, railroad men, society women, business women—in fact, people from practically all pro-



fessions and trades. Naturally, I can't expect to know a great deal about all these numerous lines; but I do manage to read a few things about nearly every profession represented by our customers, and I find it easy to pick up additional information by asking questions of the customers themselves. As a rule, it pleases a customer to have me take an interest in his business affairs. I won't say that it flatters him, but it does seem to please the average person to find somebody that wants to know something about what the other fellow is doing. Because a medical article I had read in a magazine caused me to ask a doctor a bunch of questions recently, he wanted to know where I had attended medical school.

This leads to another one of my pet beliefs—that a service manager ought to be known by his customers, as well as knowing them himself. Confidence is a big item in modern business success. While it means a lot of responsibility to possess the confidence of several hundred people, of what value to a community is a business man who is not able to carry responsibility? There are times, I'll admit, when this confidence of customers becomes rather embarrassing, because some people don't stop at relying upon me to keep their cars in shape, but come to me with all sorts of personal problems. They want me to help them select a house, for example, and to do all sorts of things that



**EARL SCHAFFLAND**

*Service Manager for W. W. Barnett,  
Oldsmobile Distributor, Denver, Colo.*

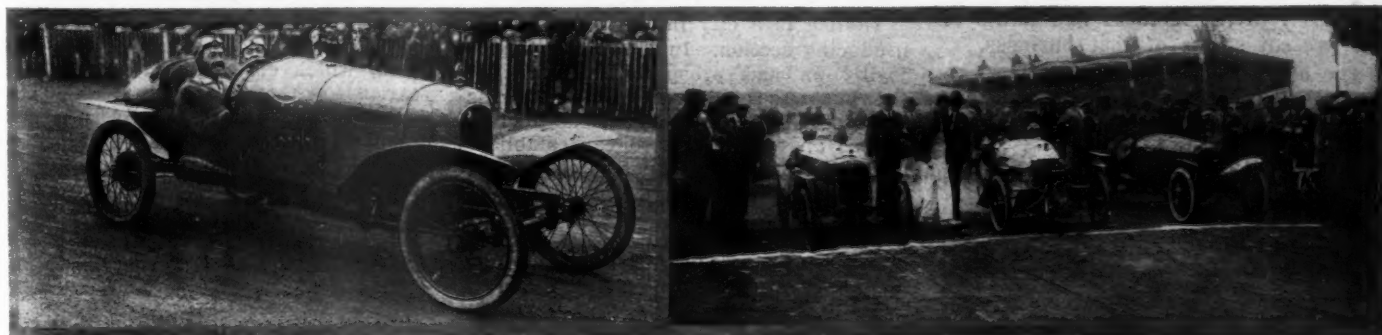
I am often compelled to tell them I don't feel capable of giving advice about. Sometimes I am able to refer them to somebody whom I know to be an expert in the particular line involved. In other cases, I find that the main thing they want is to unburden their heart of some perplexing problem that has been causing them to worry, and they seem to be grateful to me for listening to them patiently and sympathetically.

I believe I read somewhere in a book

or article on salesmanship that a good salesman needs to be a good listener as well as a good talker, and I guess this is true. In fact, some of my experiences make me believe that the good listening is often the more important of the two. Of course, I don't pose as a salesman, although I try to picture my dealings with customers as likely to have some selling effect for my employer.

#### HARMONY IN ORGANIZATION VITAL TO SUCCESS

This mention of my employer reminds me that one thing vital to the success of a service department—or any other worth-while department, for that matter—is the right kind of appreciation of the concern for which you are working. If I didn't appreciate Mr. Barnett's dealings with his employees and with his customers, I would get restless and start looking for a new job. But I have thoroughly enjoyed the nine years that I have worked for him—and with him. He appreciates loyalty, and he demonstrates loyalty. He makes you feel that you are working with him, and with everybody else in the organization, and that his institution is really a big family. Such an atmosphere is bound to have a wholesome effect on business and to build up substantial friendships.—Earl Schaffland, service manager for W. W. Barnett, Denver, Colo., Oldsmobile distributor.



Left—Lombard on French Salmson, four-cylinder, water-cooled, 67 cu. in. cyclecar, winner at Le Mans cyclecar race. Right—Start of French cyclecar race at Le Mans

### French Cyclecar Race Proves Value of Conventional Design

**A**N average of 54.6 miles an hour was maintained by Lombard, winner of the French 67 cu. in. cyclecar race at Le Mans, on a Salmson four-cylinder water-cooled machine. The distance, 193 miles, was covered by the winner in 3:32:9 4-5. Last year the average was 47 m.p.h. on the same course. Second place was won by Violet on a Mourre cyclecar with a two-stroke engine and friction transmission, in 3:50:55. Third place went to Chabreiron on a four-cylinder E.H.P., in 3:51:58. Sabipa on a two-stroke Weler came next, followed by Stoffel on a twin-cylinder three-wheel Morgan of French construction.

Additional interest attaches to this race by the growing importance given by French manufacturers to small two-

seater cars of not more than 67 cu. in. piston displacement, weighing 551 lbs. minimum and 771 lbs. maximum, which are officially accepted as cyclecars and have special taxation advantages.

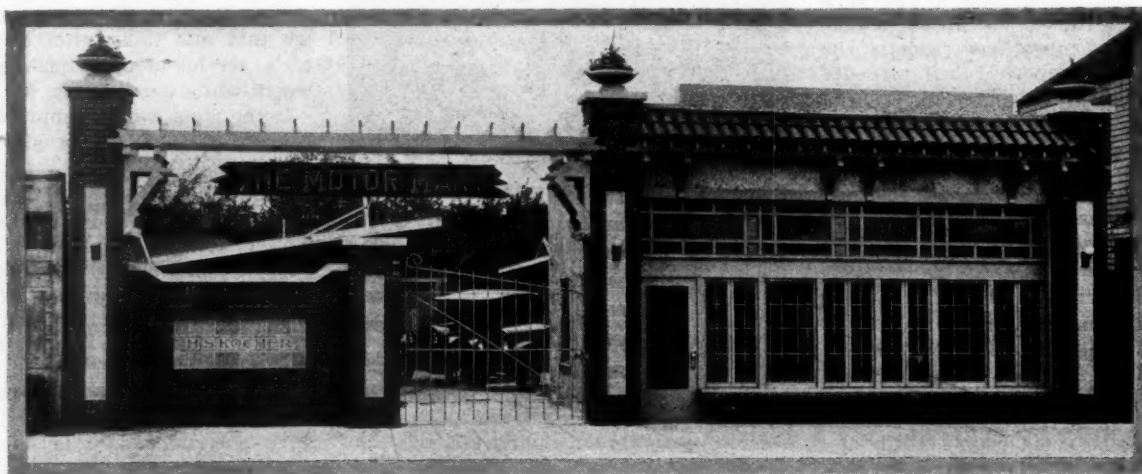
The Salmson which won the race is built by the Salmson Aviation Engine Co., one of the biggest concerns of its kind in France, and the machine is the first of a new series about to be put on the market. It is built on standard car lines, with four-cylinder water-cooled engine having valves in the head, and with clutch and gearbox forming a unit with the engine. The engine was modified for racing purposes, a special head with two inclined valves and two camshafts, with cams operating directly on the valve stems, being used. Plain bearings on the crankshaft were changed for

ball bearings. In other respects the car was similar to the stock model. Springing is by quarter elliptics front and rear, and the live axle is minus a differential. The car was equipped with Palmer cord tires, and the wear at the end of the race was negligible.

Although all types of cyclecars ran in this race, the results proved the superiority of the machines established on orthodox car lines. Everything indicates that this type of machine will eventually dominate in France over the cyclecar developed from the motorcycle and sidecar. This latter type was represented by the Morgans, of both French and British construction, but they did not give as good an impression as the four-wheel car type cyclecars.

## Putting Class Into the Used Car Business

*Here is the case of a man who had his own ideas of business. He saw a future in selling used cars. Instead of adopting the objectionable features in vogue, he raised the business to his ideal*



The clean, substantial appearance inspires confidence in the used cars offered at the Motor Mart

**T**HERE are two methods of tackling a business. One is to adapt yourself to the methods and ideals of the present status of that business.

The other is to adapt the business to your own ideals.

This is a story of a man who did the latter. He thought there was a profitable and creditable future in the used car business with a lot of the present questionable and uncertain practices eliminated; so he proceeded to eliminate the practices he objected to, as far as his own establishment is concerned. He is not concerned with the status of the used car business throughout the United States of America, but he is making it a local problem, and, as such, is solving it, so far as his direct influence is concerned.

In seeking this solution for the community of Yakima, Wash., he did not consult with the car manufacturers, neither did he wait for the local dealers' association to pass resolutions. He just rolled up his sleeves, outlined the establishment that appeared to fit into his ideals, built the place, bought the necessary equipment for the putting of these cars in condition, adopted a reasonable and honest selling plan and went to work.

So far as this man was concerned, he settled down to his own job and "let the rest of the world go by," but like many a man who does his own particular job well, he is certain to have a considerable influence.

Gradually the rest of the world began to hear about this man in Yakima and

he has been persuaded to tell his story for the good that it may do.

Yakima is a city in the famed apple-producing section. Incidentally it is enjoying unusual prosperity. A part of the business equipment of the city is the Motor Mart, which has made a record as an exclusive used car establishment that probably cannot be challenged by a like establishment in a city of 20,000 people in the country.

The Motor Mart is selling on an average of 25 used cars a month—and it is doing it without a single outside salesman. This has been accomplished by working out the ideas of H. S. Kocher.

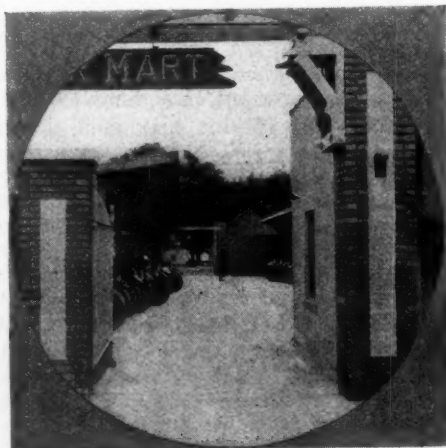
Everybody in Yakima and in the vicinity for a wide radius, knows Kocher,

the Motor Mart and Motor Mart used cars. How Kocher has been able to build up his remarkable business is explained in his vigorous advertising campaign, which costs him about \$4,000 a year. How he is able to make satisfied customers who will in turn send prospects to his Mart is explained by his policy of thoroughly conditioning every car that is purchased by him for sale, by refusing to accept out-of-date models under any consideration, and by allowing a trial to all prospects before a transaction is closed.

The appearance of the Motor Mart is impressive when compared with the obvious "maybe-we-will-stay-and-maybe-won't" appearance of the irresponsible used car concerns that come and go. Kocher believes that there is probably no other single item which serves as well to attract prospects to an automotive establishment as "appearance," both exterior and interior.

After the prospect has been attracted to the establishment, then the right kind of business policy becomes the paramount factor, but "appearance" is a chief primary factor. That is why Kocher spent a considerable amount of money for an attractive calendar to advertise his establishment. The chief adornment of this calendar was a true to life tinted photograph of his place of business. This photograph, well mounted on attractive mats, with its gold lettering, was the artistic equal of any calendar in his section.

"When I opened the Motor Mart it was my ambition to stabilize the used



Looking inside the Motor Mart. On an average, twenty-five used cars a month are sold from here



car business in the Yakima Valley," said Kocher to a representative of MOTOR AGE. "Here, like a good many other places, used cars were bought and sold on a sort of hit-and-miss proposition. I don't know of any line of business where the public is so wary and takes so little for gospel truth, as in the average used car establishment. I reasoned that if this skepticism and doubt could be replaced by confidence, the success that might be accomplished would be practically unlimited in this or any other community.

"Usually when a man buys a used car he compromises with his own desires and his pocket book but expects to draw a lemon, so he is not disappointed. He must have transportation and if he cannot afford a new car, he does the next best thing. If this same buyer were agreeably surprised, however, by getting a used car that functions properly and does everything his neighbor's new car does at a considerably smaller investment, he is going to be pleased with his purchase and is going to make a special effort to tell his friends about it.

"But how were we to overcome this prejudice which was general, and start out with a bang, selling enough used cars to make a profit? Advertising seemed to be the solution. This was done along educational lines. Our advertisements appeared every day in the three local papers. Our first year's advertising expense exceeded \$4,000.

"We adopted as our slogan 'Selected Used Cars,' the word 'selected' being more applicable to our cars than any other I could think of. In our advertising we always referred to our method of conditioning and our money-back guarantee.

"From the very start we averaged almost a car a day, with the exception of a few recent dull months. We buy most of our cars for cash; occasionally we take one on consignment. We handle nothing but late model standard automobiles. Obsolete and orphan cars are not tolerated in the Motor Mart. We make it a point to handle cars that are most popular in this locality and those that show the least depreciation from year to year.

#### HOW THE CAR IS INSPECTED BEFORE ACCEPTANCE

"When a car first comes to our place, it is inspected by the shop foreman. If it passes inspection we either buy or consign it. We never buy a car that needs a complete overhauling, or one that shows excessive use or abuse. We always grind the valves, check up on the connecting rod and main bearings. If the spring bolt bushings, spindle bolt or tie rod bushings show the least sign of wear they are replaced. Spring shackles, body bolts, etc., are inspected and tightened. Fully 50 per cent of our cars are repainted, usually the standard factory color. When a Motor Mart car has gone through its sprouts, every man in the organization is sold on it, for we all know the cars are right. So, sure

are we, that every car is sold on a 24-hour money-back guarantee. Our method of selection and conditioning eliminates all chance.

"During our first year in business we sold in excess of 300 automobiles and refunded the price of but one car. When a car is sold we see that it is completely equipped with pump, jack and a new roll of tools. We buy pumps, jacks and tool rolls by the gross.

"After a car is delivered we make it a point to give our customer the little

gether to bring the customers to us, instead of chasing all over the country after them. A Motor Mart salesman very seldom leaves the place, except on short demonstrations. Our average demonstration is not over four city blocks. Any number of automobiles have been sold at the Motor Mart without starting the motor.

"A salesman recently asked a customer after he had bought a car why he did not demand a demonstration, whereupon the customer replied he had

### Used Car Advertising That Radiates Personality



The advertising of the Motor Mart is distinctly novel and has that interesting appeal that makes you want to read it and watch for coming ads. Its frankness is refreshing after reading some of the impossible claims of some advertising, and builds confidence in the minds of men in the market for used cars

attentions that keep a man sold, and above all, retain his good will.

"When we buy a car it immediately submerges its identity and becomes a Motor Mart car. Of course, it still remains a Buick, Dodge or Ford but, on account of its 'Selection,' inspection and conditioning by the Motor Mart, and sold by it on a guarantee, it is known as a Motor Mart car. We carry this idea into our advertising as much as possible.

"We employ three salesmen; only high-class men can remain on our sales force. They are given a wide range of freedom and made to assume responsibility. They make and close most of the deals on their own initiative, and when a deal is consummated, the house stands back of them to the limit.

"We depend on our advertising alto-

heard the Motor Mart stood back of its merchandise and, if it was not satisfactory, he could get his money back. We, of course, carry this confidence idea to the nth degree in all our advertising, and by so doing are gradually elevating the used car business above a livery, stable basis.

"Aside from the profits I take out of the business every month, the thing that gives me the greatest satisfaction is the fact that in such a brief time I have convinced the automobile buying public that a 'Selected' slightly used car is a better investment from a utility standpoint than buying a new one. In Yakima people no longer are afraid of a used car. Not only the Motor Mart but all local dealers give used cars especial attention. People have been led to expect a square deal and they are getting it."

#### WHAT IS A PHOTOGRAM?

IT'S our own invention, a cross between a photograph and a diagram, for if you have ever tried to match up the lines on a wiring diagram with the internal leads on a generator or starting motor, you will appreciate this new type of diagram. The usual diagram and the machine that it is supposed to explain, have usually no apparent relation to each other, so it is our intention in a new series of electrical articles by A. H. Packer, starting in an early issue, to show the operation of various systems on popular cars and show the internal circuits on a sketch that has the same appearance as the actual machine.

# How Armature Growler Operates

## *An Explanation of Principles of Tester for Analyzing Armature Troubles—A Scientific Method of Detecting Faults*

By J. C. Miller

*Electrical Engineer of Joseph Wiedenhoff*

**S**ERVICE stations are rapidly changing their character. There is a decided trend toward specialization either by the special shop or departmentalization of the large shop. Not long ago, any employee of a shop attended to the electrical repairs, the battery, greased the car, adjusted the brakes and clutch, and made all engine repairs. Each employee did all that was to be done.

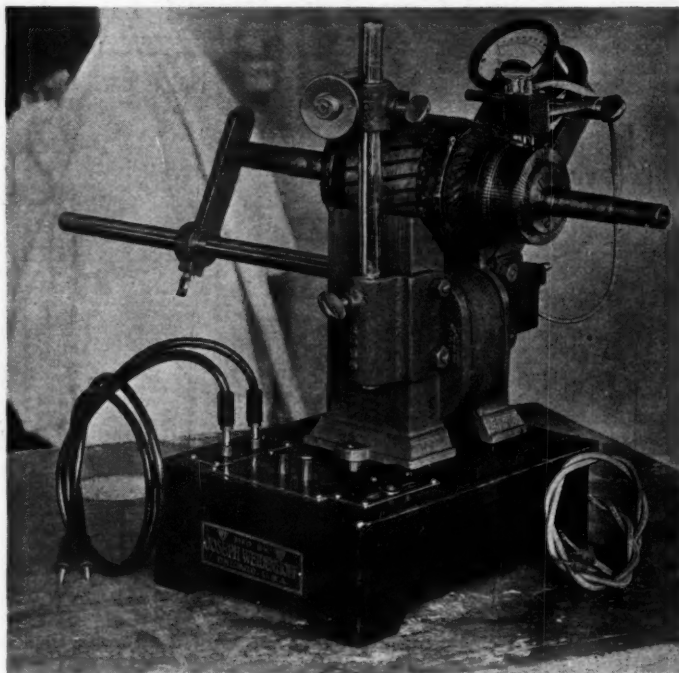
Today, we have the ignition expert, the battery station or department, the greasing platform and the engine repairshop with its high-grade grinding machinery. All this is to the greater advantage of the car owner.

The automotive electrical expert has a broad field to cover, for under the hood of the automobile today are found devices which embody every principle of the electrical industry as completely as the largest city power plant. He must be expert along direct and alternating current lines. He must know the electro chemistry of the storage battery. A broad, all around electrical knowledge is necessary, as service stations are becoming specialized so that the expert of the station must go deep into the troubles that are brought to him.

When an armature was found faulty in former days, that was the end of it. Back it went to its home factory, with a consequent delay. Now the armature is being carefully inspected for faults in the well equipped service station and the trouble is quickly and definitely located.

To aid in this analysis of the faults of an armature, a device is being used which is little known, although not new, for it has been used on large armatures for years. This is the armature tester or growler, so-called because of the noise it gives out when in use. The principle of the growler is simple and is based upon induction, the mysterious principle, the action of which is herein-after briefly explained.

Referring to Fig. 1. When a current of electricity flows through a coil of wire which is wrapped about an iron core, there is set up in the core a flow of magnetic lines. These remain constant in



Armature tester or growler with armature in position  
Note the voltmeter for taking segment to segment reading

number as long as the current is constant and vary with every change in direction or strength of current. They reverse when the current reverses and alternate in direction when the current alternates. If the iron core does not make a closed circuit, these magnetic lines must travel part way through the air, which offers great resistance to their passage. Such a core is called an open one. These cores must be made of special electrical sheet iron of thin gage, in order to limit the eddy currents set up in

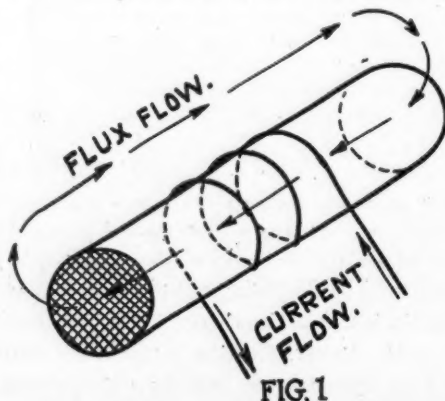


Fig. 1—A coil with an open core showing path of magnetic lines

them and to reduce the heating effect of these eddy currents. A solid core would become very hot when used for a long period.

The iron core of the armature tester or growler is in itself of the open core type, as shown in Fig. 2. It is made of a bundle of punched plates of electrical steel, tightly compressed together, having the original mill scale left on them for insulating from each other, or, better still, insulated by a light coat of shellac or varnish. Across the gap at the top, the magnetic lines must jump through the air.

A closed type of core is shown in Fig. 3. Here we have a complete iron circuit and the resistance of the circuit to magnetic flow or flux is reduced to a minimum. This resistance depends upon the quality of iron in this core.

With the growler the iron circuit is made a closed one when the steel of the armature comes in contact with the faces of the core punchings, as shown in Fig. 4. It will be seen that actual metal to metal contact is necessary to make the circuit of the lowest possible resistance.

If the magnetic flux produced by a current in a coil threads through another coil, there is induced in the second coil a voltage, and if the coil is a closed one, a secondary current flows. This is the transformer principle, and is shown by Fig. 5. This principle is applied to the armature, as in Fig. 6. Here an armature having a single coil wound in the slot is mounted on the core of the growler. When alternating current passes through the primary coil, a voltage and current is induced in the coil of the armature. The voltage in each coil is nearly in proportion to the number of turns through which the magnetic flux threads. In Fig. 5, the secondary coil has one-third the turns of the primary. It has, therefore, almost exactly one-third of the voltage.

If the armature in Fig. 6 is rotated so that fewer lines of force thread the coil than thread the primary, less voltage will be induced in it. All coils to give the



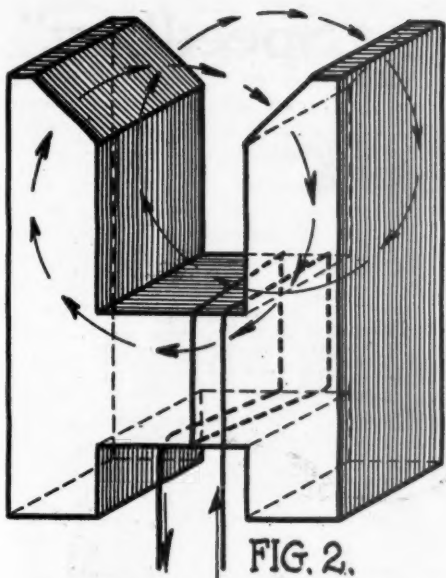


Fig. 2—The sheet steel core of the "Growler"—in its present condition an open magnetic circuit having an air gap

same reading must be similarly located with respect to the magnetic circuit.

Upon the above principle, the growler is built. In order to make a perfect examination, then, of the condition of an armature by means of a growler, a meter of some kind should be at hand to indicate the conditions at the commutator segments which form the terminals of the armature coils. Judgment based upon the size of a spark or the glow of a lamp is not accurate enough to point out troubles. A meter of some kind is desirable. It will also be seen that the voltage and current is going to depend also upon the style of winding used in the armature.

If the armature in Fig. 6 is from a

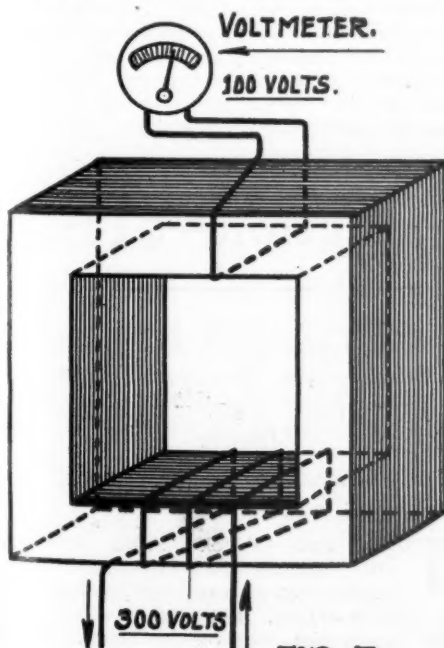


FIG. 5.

Fig. 5—A voltage and current is induced in the second coil by the alternating current of the first coil, through the agency of the magnetic flux in the core

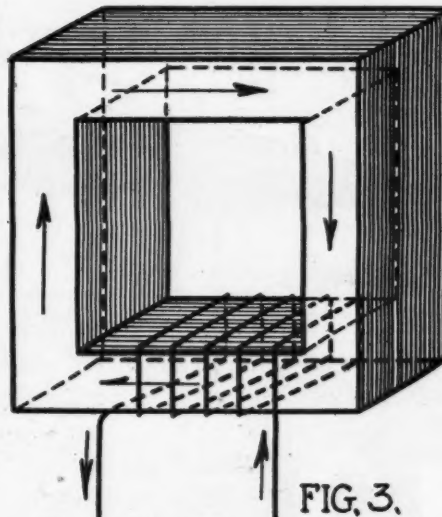


FIG. 3.

Fig. 3—A closed magnetic circuit offering the lowest resistant path to the flow of magnetic flux

starter, each coil will consist of a single turn of heavy wire. If from a generator producing 16 volts, each coil will have many turns of finer wire. The voltage induced in the coil of the starter will be low compared with that in the generator. To bring them both to a reasonable, readable value, we must control the voltage in the primary coil growler winding so as to bring the induced current within our meter range.

Having then a growler so arranged as to be able to locate an armature with any of its slots in any identical position with respect to the growler core and with a constant value of alternating voltage on the winding, all adjacent commutator bars similarly placed will give like readings as long as coils in the slots are perfect. Should an imperfect coil exist, either as a short-circuit, a loose or reversed connection, the little meter or indicator will show it.

The operation of the growler may be shown by a test on a Ford starting armature. This is one of the most difficult windings to test because of its few turns. However, the growler, properly devised, will detect any trouble.

The armature is placed upon the growler. Care should be taken that the steel of the growler face bears upon the steel of the armature, in order to secure a good closed magnetic circuit. Some ratchet device is necessary to locate all slots successively in an identical location. Two contact fingers are caused to bear upon adjacent commutator bars, always maintaining an identical position. Alternating current is regulated in the primary so that the secondary reading come within the meter capacity, and then a series of readings is rapidly taken about the armature. The results from an actual test show no greater variation from coil to coil of over two points on a meter graduated, from 0 to 100. This shows all coils are in perfect shape. For the sake of comparison, if a circuit clamp of metal is placed upon any two coils at the rear, shorting them, the reading on commutator bars connected to these coils then drops 16 points, at once indicating a short.

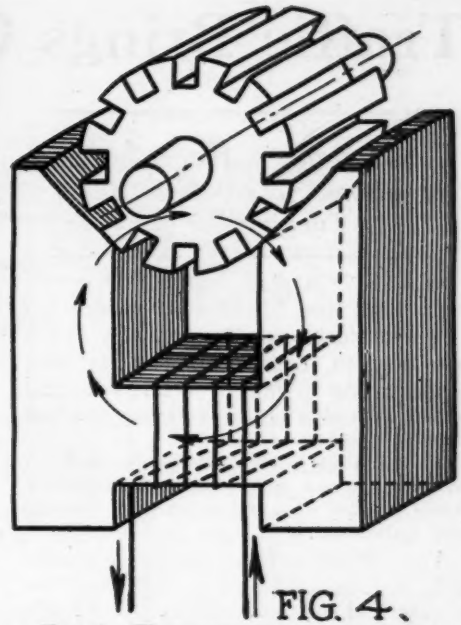


FIG. 4.

Fig. 4—The magnetic circuit of the growler is completed by the armature core. No air gap should exist

On open coils, the meter indicates 0. In loose connections, there is a lower reading than normal. Grounds are at once indicated by a test lamp. With a faulty generator, armature variations from the normal correct reading are more pronounced. The slightest deviation from a normal reading with such an arranged growler locates and indicates trouble. The necessary devices to remove the growler from the province of the guesser to that of the positive, accurate, scientific worker are

Accurate armature locating devices.

Contact points to maintain fixed positions.

Adjustable primary current.

An indicating meter.

Such an equipment gives the electrical expert a new tool for the exact location of armature troubles.

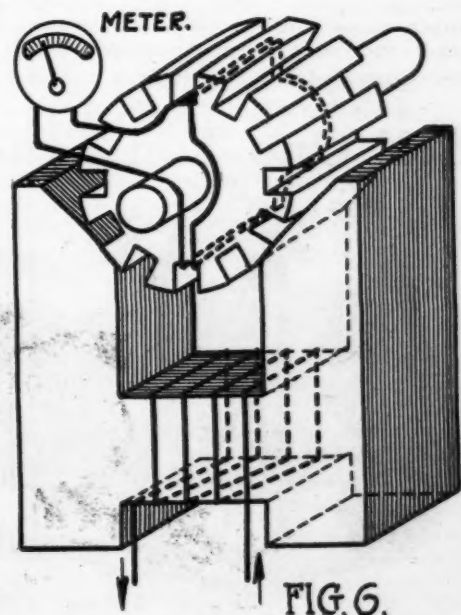


FIG. 6.

Fig. 6—An armature with coil in place. All coils similarly placed, excited by the same primary current, will give like meter indications

## Traffic Brings Out Light Truck—"Speedboy"

*Designed to Have Large Loading Space with Short Turning Radius*

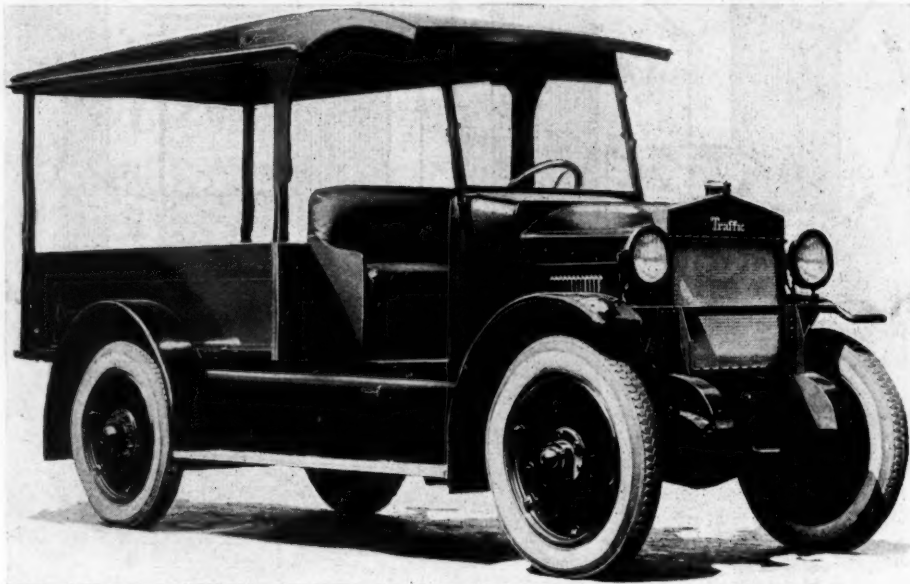
**I**N the new Traffic "Speedboy" announced by the Traffic Motor Truck Corp., St. Louis, attention has been given in its design to a large loading space with short turning radius and low hung chassis.

This makes a shorter lift in loading, provides room for maximum capacity loads of 3,000 lbs., and saves time loading and unloading.

The "Speedboy" is completely equipped, including pneumatic cord tires on heavy disk airplane type wood wheels and electric lights and starter. The top is full length, 5 ft. from floor, with roll-up curtains at side and rear ends with side drop curtains. The driver's cab is roomy and comfortable. Load area measures 8 ft. long, inside from rear of seat, by 44 in. wide. The body is finished in traffic standard red with white stripes and black trim.

Standard units are combined in its design. Continental motor, Bosch magneto, Covert transmission, Gray & Davis starting and lighting system, Carter carburetor, Russel internal gear rear axle, Timken roller bearings, Detroit steel springs, Fisk tires.

Specifications in detail are as follows: maximum capacity, 3,000 lbs.; chassis weight, 3,400 lbs.; road clearance, 12 in. The motor is Continental "Red Seal" four-cylinder unit power plant, three point suspension, 3 3/4 in. bore, 5 in. stroke, three-bearing crank shaft; maximum motor speed, 2,000 r.p.m. The lubricating system is a combination force feed and constant level splash; a gear driven pump supplies oil to the timing gears and main bearings; other parts are lubricated by oil splash. The



New Traffic "Speedboy" has a low hung chassis which makes it easier to load because of the shorter lift

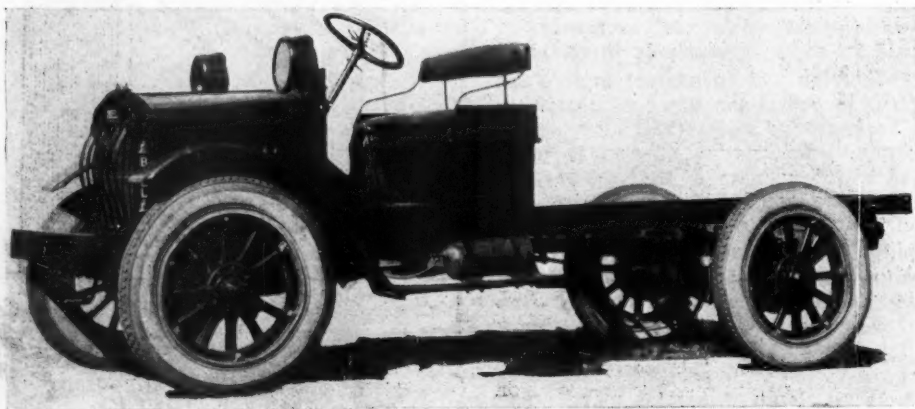
Carter carburetor is a special automatic with gravity feed; gasoline tank, capacity 12 gals., is made of pressed steel and located on dash.

Ignition is Bosch magneto; thermosiphon cooling system, 2-inch intake and outlet water connections, with 15-in. fan, mounted directly behind the radiator are used; the radiator is of cellular type mounted in 4-piece cast-iron shell. The transmission is Covert, three speeds forward and one reverse; all gears are of three per cent nickel steel, heat-treated and ground. Extra large roller and ball bearings are used. The propeller shaft is two-piece with three universal units; alignment of the drive shaft is maintained by a self-aligning roller bearing which eliminates vibration, whipping and other distortion; control consists of steering gear on left, 18-in. wheel, worm and gear type; gear

shift and hand brake levers in center; spark and throttle control on steering column.

Pneumatic cord tires, Fisk, 35 by 5 front and rear, are standard equipment. Starting and lighting system is Gray & Davis, four inch round starter, Bendix drive, Gray & Davis five-inch round generator, through shaft for magneto tandem drive; head lamps complete with single contact dimmer and head bulbs and non-glare lenses, and a tail lamp are supplied. Equipment includes pneumatic cord tires, starting and lighting equipment described above, explosion whistle, full set of 16 gage roll fenders, running board skirts, front splash, running boards, speedometer, two-way ventilating metal windshield, seat and cowl, canopy top body; full set of tools; chassis and body completely painted, striped and varnished.

## Bell One Ton Truck Again in Full Production—\$1495



The Bell one-ton truck has an extra large radiator and the tank, sides and core are removable. Weight of truck with full equipment, 2,550 lbs.

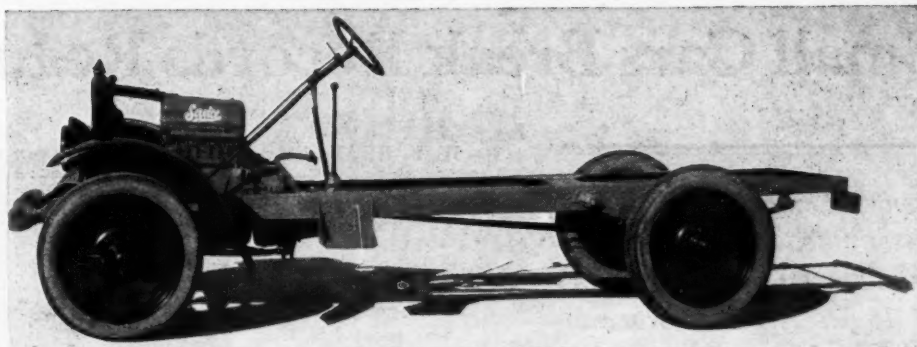
*Sold Completely Equipped,  
Including Driver's Seat,  
Pneumatic Cord Tires and  
Lights*

**T**HE Bell Truck Sales Corp., Ottumwa, Ia., has announced the resumption of capacity production on the model M, Bell one-ton special. This model has been on the market for more than a year and sells for \$1495 with complete equipment, including driver's seat, pneumatic cord tires and lights.



The engine is a Buda, four-cylinder, cast in block, detachable L head type, with a bore of  $3\frac{3}{8}$  in. and stroke of  $5\frac{1}{2}$  in. The power plant is on three point suspension and is cooled by a centrifugal water pump and a 15 in. fan. Ignition is from Eisemann magneto equipped with impulse starter. Oil is forced to all bearings and important working parts of the engine by an oil pump. The Zenith carburetor is used and is operated with a throttle control on the steering column and a foot accelerator.

An extra large radiator is used on this model to insure ample radiation, and the tanks, core and sides are removable. The core is flat tubular. Gear-set is in a unit with the engine and is of the elective sliding gear type with three speeds forward and one reverse. A multiple dry disk type clutch is used.



Chassis of the Service speed truck. Disk wheels are standard equipment

The worm gear is used in the final drive of this truck, which is full floating with both the emergency brakes enclosed. Tire equipment is 35 by 5 truck cords. The weight of the truck with full equipment is 2550 lbs. The gasoline

tank has a capacity of 15 gals. High gear ratio is 7.2 to 1.

Chassis lubrication is by high pressure system. This truck is furnished also as the Bell Contractor's Special, which has a 98 in. wheelbase.

## Service Speed Truck Continued with Minor Refinements

### Front Spring Mounted Crosswise, Giving Greater Flexibility and Minimizing Frame Distortion

AT the front end of the Service "Red Pyramid" speed truck, made by the Service Motor Truck Co., Wabash, Ind., a semi-elliptic spring is mounted crosswise, the ends being carried on the axle and the center supporting the frame. The entire truck is carried on a three point support.

Detailed specifications are:

Engine.—Midwest. Heavy duty truck type. Cylinders,  $3\frac{3}{8}$  in. bore; 5 in. stroke. Four cylinders cast en bloc; cylinders cast integral with upper half of case. Four-point suspension. Overhead valves, operated by push rods inclosed on left side of engine. Extra large, heavy duty, counter-balanced crankshaft.

Carburetor.—Plain tube type, with hot air stove attachment and choker located on instrument board.

Ignition.—Remy distributor. Spark control by hand lever underneath steering wheel.

Cooling.—Continuous fin and tube type core. Pressed steel radiator shell mounted on leather pads to absorb shock and vibrations.

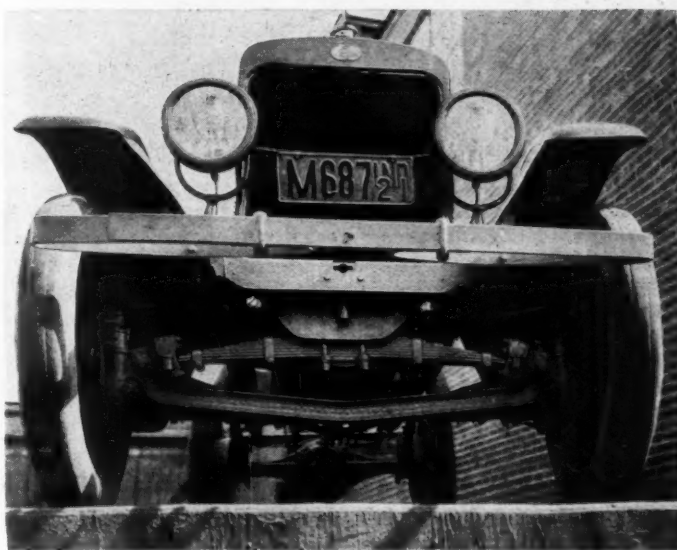
Clutch.—Brown-Lipe. Single dry plate clutch.

Transmission. — Brown-Lipe. Selective type. Three speeds forward and reverse. Mounted in unit with clutch and engine. Timken taper roller and annular ball bearings throughout.

Rear Axle.—Spiral bevel gear. Fixed hub type with straddle mounting of drive pinion. Taper roller bearings. One-piece pressed steel housing.

Front Axle.—"Service." Specially designed to accommodate cross front spring construction.

Front view of the Service speed truck showing the cross spring construction which gives flexibility to running gear and minimizes frame distortion



Brakes.—Internal expanding, cam actuated. Service brake operated by foot pedal; emergency brake by hand lever. Both brakes' being inside the drums avoids interference with skid chains.

Control.—Left hand drive, center control. Gear shift and emergency brake levers mounted on transmission. Spark control by hand lever under steering wheel. Throttle control by hand lever under steering wheel, and foot accelerator.

Frame.—Pressed steel channel section. Chassis, 30 in. high.

Frame is rigid construction, supported on special three point spring suspension, providing against racking of body, seat and hood.

Springs.—Semi-elliptic front and rear. Front spring pivoted to frame at center, providing three-point suspension of frame.

Wheels.—Disteel single disk, demountable at hub. Interchangeable front and rear. One spare wheel.

Tires.—Pneumatic.  $34 \times 4\frac{1}{2}$  in; front;  $35 \times 5$  in. rear. Non-skid.

Gasoline Tank.—In cowl. 12 gallons capacity.

Wheel Base.—132 in.

Gear Ratio.— $5\frac{1}{2}$  to 1 standard. Optional,  $5\frac{1}{2}$  to 1 and  $6\frac{1}{7}$  to 1. Normal speed 25 to 30 miles per hour.

Chassis Weight.—3100 pounds.

Equipment.—Remy electric starting and lighting equipment. Exide battery. Electric head lamps. Cowl-light. Tail lamp. Electric horn. Jack. Tire pump. Set of tools. Oil can. Spring bumper. Front fenders. Steps. Instrument board. Gasoline tank. Toe and floor boards.

Price—\$1840 f. o. b. Wabash, Indiana.

### NOMA AGAIN REDUCED

New York, Oct. 8—The second reduction in 60 days has been announced by the Noma Motor Corp., manufacturer of Noma cars. The change made is as follows:

	Old Price	New Price
Roadster .....	\$2,800	\$2,500
4-passenger touring.....	2,850	2,550

The prices are f. o. b. factory, plus war tax. No change has been made in the prices of the other models.

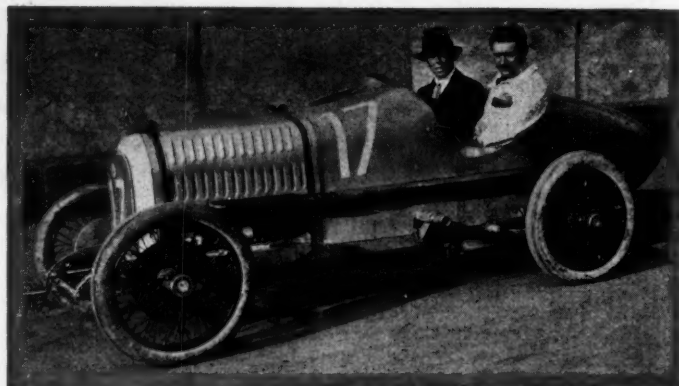
# Small Cars Break Records Regularly in Europe

By W. F. BRADLEY

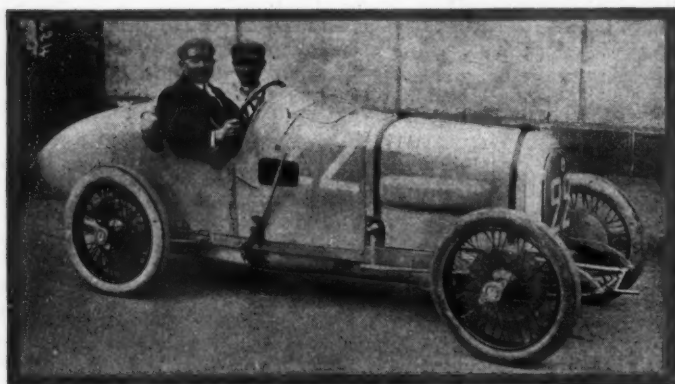
European Correspondent  
of Motor Age

*Rene Thomas, of Indianapolis Fame, Drives 91.5 Cu. In. Talbot-Darracq 72.1 M. P. H. in 279 Mile Race at Le Mans, France*

The Englishman, K. Lee Guinness, was second in the Le Mans race, also driving a Talbot-Darracq



Rene Thomas in the four-cylinder Talbot - Darracq. This car has a piston displacement of only 91½ cu. in.



**W**ORLD's records were broken at Le Mans, France, recently, when Rene Thomas, driving a four-cylinder Talbot-Darracq won the French 279-mile light car race in 3 hrs., 52 min., 16 sec., or at an average of 72.1 miles an hour. This race was open to cars having a piston displacement not exceeding 91½ cu. in., with a maximum weight of 1146 lbs.

Thomas was followed home by the Englishman, K. Lee Guinness, driving a similar car, in 3 hrs. 54 min. 10 sec. Third place went to another Englishman, H. O. D. Segrave, also driving a Talbot-Darracq, in 3 hrs. 54 min. 50 1-5 sec. Bedford, driving an English Hillman got fourth place in 4 hrs. 28 min. 15 sec. Carteau on a French La Perle was fifth in 4 hrs. 48 min. 31 sec. Marshall on an English Aston-Martin finished sixth in 4 hrs. 59 mins. 24 sec. One other car, a French Tic-Tac, was running when the race was called off, and ten machines failed to finish. Of these eight were French and two British.

The average speed obtained by the winner in this race compares with 78.1 miles an hour set up by Jimmy Murphy on a 183 cu. in. Duesenberg over the same course, and beats the record set up by Buggatti at Brescia, Italy, ten days earlier. The Italian course, however, is very much faster than the one at Le Mans, and the announced average of 72 miles an hour obtained there should be reduced to 71, owing to a slight mistake in measuring the length of the course. The Talbot-Darracq success, therefore, constitutes a world's record for cars of this piston displacement. It is worth noting that the average set up by Thomas is equal to that of Jules Goux

in his 122 cu. in. Ballot over the same course, in the French 183 cu. in. Grand Prix last July.

The Talbot-Darracq team had this race entirely in its own hands, for the other French and English cars were decidedly outclassed. These machines got the lead at the beginning of the race and held it to the end. The order at the beginning was Guinness, Thomas and Segrave. This changed later to Guinness, Segrave, Thomas, when the Frenchman stopped at about half distance to replace a clip holding the leather gaiter around the forward universal joint. From this time Thomas began to climb and to break lap records. He beat Segrave's time, and on the seventeenth of the 26 laps got into the lead and held his position until the end.

The three cars finished in the order in which they had started, the only difference being that Guinness closed up on Segrave and Thomas was only one hundred yards behind Guinness when he cut the line a winner. The entire distance was covered without a stop for tires, gas or oil; indeed the only stop made by the team was the one by Thomas, to replace the loose clip. Not a single tire was changed by the six cars which finished the course. This is in marked contrast to the 183 cu. in. race here last July, where tire wear was heavy. The winners used Pirelli clincher bead cord tires.

Thomas began his lap-breaking performances on the 14th lap, which he covered at an average of 73.5 miles an hour. On the 15th he increased this to 74.2 miles, and on the 16th made his final record of 74.5 miles an hour for one lap of the course. These speeds were made

on a triangular course a little more than 10½ miles round, with gradients varying from 3 to 4½ per cent and four practically right-angle turns. It is estimated that on a fast course such as that at Brescia, Italy, the cars could have lapped at 80 miles an hour.

The best English performer was Bedford's Hillman, which, being a side by side valve job, was outclassed in speed by the special overhead valve Talbot-Darracq, but made a fine showing. It stopped once to change a broken steering arm, this stop costing the driver six minutes. Marshall's Aston-Martin was troubled with persistent plug trouble. Douglas Hawkes, on Horstman, was forced out with a broken ball bearing in the rear axle, and Harvey on Alvis cracked his engine base chamber and lost all his oil.

Collomb, on French Carr La Licorne, was expected to put up a fight against the Talbot-Darracq, but he never had the same speed and was forced out about half distance with valve trouble. A team of Weler cars with the special Violet two-stroke engine retired with various mechanical troubles.

The winning Talbot-Darracqs are of the same general design as the eight-cylinder 183 cu. in. cars run this year at Indianapolis and in the French Grand Prix. The same cylinder block is used, but the engine instead of being carried in a sub-frame is mounted directly in the main frame members. The car has four speeds and reverse, the gearbox forming a unit with the engine. Drive and torque are taken through the springs, and front wheel brakes are fitted. Each car ran in the race with a pair of Solex carbureters. These did not give the maximum speed, but proved better than any other make in acceleration. Delco ignition was used, but owing to the difficulty in getting down to the weight limit of 1146 lbs., the generator was left off, the current being supplied to the plugs from the Prest-O-Lite battery. No trouble was experienced in this respect.

These cars will line up in the English 200 mile race to be run on Brooklands track during the month of October.



# Manufacturers At Last SEE the USED CAR As Their Problem

*Relations of Factory and Dealer Are Topic for Discussion at Annual Meeting of N. A. C. C. Help Assured in Problems of Financing and Sales. Contract Study Will Be Continued*

By James Dalton

News Editor, Class Journal Co.

FULL recognition of the fundamental fact that the automotive dealer has problems of his own was given by the manufacturers at the annual members' meeting of the National Automobile Chamber of Commerce in New York last week.

As a matter of fact, the discussion centered almost exclusively around the fundamental question of how to help the dealer help himself. The big question was, "How Can We Help the Dealer?" and there was a string of interrogation points back of it.

There were many questions, and if they are applied by the sales organizations of the individual manufacturer and individual dealer, they will knock down a good many of the question marks like ten pins.

So far as concerted action by the manufacturers is concerned, there is little probability of it. The general opinion is that it is up to each individual. Conditions in each factory and each dealer organization are different, and it is virtually impossible to map out any plan which would be applicable to all of them.

Attention was given first to the used car problem, which is admitted to be one of the most difficult confronting the industry. It is common to all companies and to all dealers.

Perhaps the most concrete proposal made in this connection was that manufacturers gage their production not alone by the demand for new cars, but by the market for used cars. This would relieve in some measure the tendency to load dealers with cars they cannot handle. This met with more or less general approval.

Other proposals made were:

That all used cars should be reconditioned before they are sold and given the same backing by the dealer that he gives to new cars. This would inspire confidence on the part of prospective purchasers and bring many new prospects into the market. It was felt that every purchaser of a used car was a potential purchaser of a new one.

That dealers should establish cooperative repairshops where used cars could be reconditioned, instead of each dealer maintaining his own shop.

That each dealer should assign his best salesmen to the task of selling used cars, instead of leaving it to the "cubs."

That each salesman should be compelled to find a purchaser for every car he takes in a trade.

That there should be a cooperative advertising campaign on the part of the manufacturers to promote the sale of used cars. There was a sharp division of sentiment on this question, however, and it seemed to be the general idea that each manufacturer should work with his own dealers in advertising used cars.

Perhaps the most encouraging point in the discussion from the point of view of the dealer is that the manufacturer has begun to study the sale of used cars and has come to realize that it is one of his own problems and the chief obstacle in the way of increased production.

Next in importance to the discussion of the used car market, and in some respects overshadowing it, was the debate on ways and means to assist the dealer to finance himself. It was evident that the dealers can look for little actual financial

assistance in this direction. The most he can hope for is that his manufacturer will assist him in paying the carrying charges of some reputable financing company to handle vehicles actually on his floor. It was conceded that the car makers who are in a strong enough position themselves to do it should undertake this work. That seemed to be about the only concrete suggestion made along the lines of financing. If it were carried into effect, it would permit dealers to carry a stock of cars through the winter.

It was undeniable that there was apparent a feeling on the part of the manufacturers that the time has come for the elimination of the dealer who is not a real business man and who has scant financial resources of his own. Stripped of its verbiage and brought out in brutal frankness, it meant a survival of the fittest.

The manufacturers seemed willing, however, to assist in every way in their power in selling bankers throughout the country on the essentiality of the motor car and thereby inducing them to assume a more liberal attitude in regard to dealer paper. It was felt that the recognition given the industry by the big bankers of New York and other large cities would have a beneficial effect.

Some of the members present thought manufacturers should assist in financing their distributors in such a way that they could carry stocks adequate to assure their dealers a reasonable supply. Some of them said they had done this and would continue to do it.

In more than one case, however, it was stated frankly that if it was necessary to help finance the distributor, the sensible procedure would be to eliminate him and carry stocks for dealers in factory branches.

While many of the manufacturers assert with all possible emphasis that they never will dispense with their distributors, it is undeniable that a growing number of them admit they regard the distributor as more or less of a luxury. They contend that he will be gradually eliminated and that he will not appear in the industry in the not far distant future.

As a result of the discussions, the N. A. C. C. will make an investigation of markets, to determine in what way dealers can best be helped and educated. The inquiry also will go more thoroughly than heretofore into financing of car sales, although the manufacturers feel that this is largely a dealer problem. The car makers feel that they are carrying their end of the business and that the dealer should do as much.

The feeling of the manufacturers was that automobile financing companies are useful, provided their charges are not excessive. It was pointed out that the percentage charged for the three winter months appears to be high but that in reality it should be spread over the entire year. The financing companies are in a stronger position than at any time since the depression began and they undoubtedly will be able to meet the needs of dealers if the latter are conservative as to credits granted by them.

Contract changes proposed by the committee representing the N. A. D. A., which has had two sessions with a special committee appointed by the N. A. C. C., were explained to the members. They were discussed at some length and the N. A.

(Continued on page 45)

# MOTOR AGE

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## Some Other Service

THERE are some folks who appear to think that the automobile service is the sorest spot in the entire industrial world. In fact, you can often hear expressions that indicate that the speaker believes that there never was anything quite as bad—all of which indicates that the speaker does not know what he is talking about.

There are several industries considerably older than the automotive industry that have not yet cleared up their service problems; and while it is a melancholy satisfaction, when you have a cold to hear about the man who has tuberculosis, yet it is sometimes well to call attention to the fact that all of the business faults are not within our industry. We can admit that we are not spotless, and yet not be the only offenders.

The other day a car owner's wife bought a sewing machine in the used machine market. Of course, she did not get a guarantee, so when she found that this machine broke thread frequently she was without recourse. She asked the service station of the makers (quite a reputable firm) to put the machine right and she had a sizable bill to pay; but the machine kept on breaking thread.

Then she went to an independent service station and there learned that the machine was a discontinued model. This man wanted \$28 to rebuild the machine, or

he would allow \$35 on a trade for the machine that he sold. The woman decided to stand pat.

While she was out shopping on Saturday afternoon her husband, who is a tinkerer, slipped into the sewing room and gave the machine the once over. He found a rough edge on a shuttle, filed it smooth in about ten minutes and the machine has not broken a thread since.

Some day, perhaps, the sewing machine service industry will reach the high average of the automobile service—if we do not improve. But, of course, we are going to march steadily upward.



## Flat Rate Plan Again

RIGHT now there seems to be much discussion pro and con about the flat rate plan of selling service. Some of those whose lot it is to handle service problems believe the flat rate or fixed price method the only method by which both customer and dealer are benefited alike.

There are, on the other hand, those who are not sold on the flat rate, believing the maximum estimate plan the logical solution of the problem. These latter are of the opinion that there is so much variation in the same service operations, even on the same make of cars, due to conditions of driving, climate, etc., that it is impossible to make a flat charge for all.

Those who advocate the fixed price system and have installed it with apparent success feel that this point is solved by establishing a time factor for any service operation by taking the average of the time required to do that operation, say a dozen times.

It seems a relatively easy thing to establish a flat rate for the more common service operations like valve grinding, brake adjustment, wheel alignment, chassis lubrication, etc. On some other jobs, however, the matter becomes a little more difficult. For example, certain classes of radiator repair work, third member work, electrical work, gearset, etc. Yet, we know of institutions who have worked out a flat rate for every service operation, even down to such jobs as upholstery work, door repairs, painting the hood, putting the owner's monogram on the door, etc.

Every service station must work out its own time factor and price for its flat rate work. Local conditions, equipment of the shop, etc., are influencing factors. For instance, fender work is not the same in all parts of the country on the same make of car. In certain sections the air contains substances which rust or "freeze" the nuts and bolts so solid that they have to be chiseled or drilled out. Obviously, this is a longer procedure than where the nuts and bolts can be removed in the usual manner.



## Do We Need Reforming?

LAST SUNDAY a man who has long been engaged in selling automotive equipment went riding in his car, accompanied by his wife and some friends. He found that his oil was running low and stopped at a roadside shop, ordering three pints of oil put in the crankcase. This was on a much traveled tourist road.

The service was rendered and a demand made for \$2. The equipment man took 50 cents from his pocket and handed it to the oil dealer. He said: "I don't know how you arrived at that price, but this money is a liberal payment. If you do not think so, there is a police station just a block away, and we will go over there and adjust this deal."

The dealer did not accept the invitation to go to



the police station, but stood at the side of the road and cursed the car owner loudly and violently as long as there was any chance of the car owner and his friends hearing him.

Which will be the most satisfactory in the end: cursing a man or getting a repeat order?



### Lessen Accidents

**F**EAR of driving accidents is one of the greatest sales resistants that is being raised against the automobile today. This is one resistant that the dealer does not hear of as often as he does some others, because the person who holds it does not get on the prospect list. He does not even inquire of the dealer how much a car costs.

The accident problem is a serious one but, like other problems, it can be solved. Recently the Bureau of Public Roads conducted a three months' survey in Maryland to learn where the accidents occurred. The result was somewhat of a surprise, as it was found that the accidents did not take place at the dangerous points in the highways, but on the smooth, even stretches. It was found that the warning signs at the so-called dangerous points were a sufficient warning to drivers to move cautiously and few accidents were reported from these points.

Any trade organization can make a survey of its territory and erect a few warning signs; also a trade association can interest itself in adequate enforcement of the existing traffic laws and in that way lessen accidents.

The money that comes to the service shop from a wreck is the most dearly earned money that the service shop gets. Each wreck helps to build up resistance to the business.



### Proposed Uniform Vehicle Law

**A** NEWS item received by MOTOR AGE tells that the dealers' associations in the Carolinas have set out at this early season to bring about the passage of proposed uniform vehicle and anti-theft laws in those states.

Another item tells of a meeting in Boston where a large number of men representing many phases of the automotive industry and automotive transportation in New England met and devoted a considerable session to discussing the prospects of more uniform legislation for that group of related states.

This is as it should be. The only fault to be found with these announcements is that it was necessary for these organizations to "begin" work. This work should have been under way years ago; but if it has not been started in your state or group of states, correct that error by "beginning" at once. There is a great work ahead of industrial and business organizations in this regard and the "beginning" has been too long delayed.

Today sales are being lost and the industrial use of automotive vehicles is being greatly impaired by unwise and often silly legislation. The industry cannot afford to stand off and criticize these laws. As a matter of fact, it is the fault of the industry that many of these laws exist. This industry, with its long list of vehicle owners, has long been powerful enough to bring about decent and fair legislation, if those concerned had only dropped some foolish difference of opinions, some petty jealousies, some indifference, and set to work.

It may not be known to all interested in this industry that there exists the draft of a law that is regarded as

satisfactory by the leaders in all branches of our industry. This is known as the Proposed Uniform Vehicle Law and was compiled by representatives of all national automotive associations in consultation with the representatives of the highway associations and the A. A. A. Nearly every one who reads this law has some minor objections to it, but it comes nearer to meeting all interests on a common ground than any other draft. It is distributed by the Motor Vehicle Conference Committee in the Marlin-Rockwell Building, New York.

If your association is going to get into this very important legislative program this year, you should have a copy of this law as a basis for your work, and because of the strong influence that can be brought to bear, urge its passage. And, come to think of it, there is no excuse for any industrial or business association in this industry not taking part in this work, as its success will contribute directly to the pocketbook of every one who owns or is interested in automotive vehicles.



### Priming the Pump

**O**NE of the important bankers of this country opened the bankers' convention at Los Angeles last week with a speech that was widely heralded in financial papers as an important contribution to serious literature. His topic was "Priming the Pump." This banker was a farm boy and he told how, in his boyhood days, he often had to get up early in the morning and hustle over to a neighbor's to get some water to prime the farm pump. This was because some one had used all the water in the bucket the night before.

He said that someone had come mighty near using up all of the available money for the promotion of industry recently, but now it was the duty of the bankers to supply the priming for the business pump and soon the full volume flow of business would be in progress.

But why leave it all to the bankers? Why cannot the little man help just as well? He can hustle a bit, urge sales a bit and send just a little more money to the factory that makes his goods—which will help. He can push a little harder on collections and send the money to the factory a bit earlier—which will help.

When the number of dealers in an industry reaches the large numbers of those engaged in selling automotive vehicles, equipment and service, a small contribution from each helps wonderfully.

Why wait for the bankers?



### Cooperative Advertising Campaigns

**E**VERY service executive and every dealer in the country should be interested in the experiment by the New York and Brooklyn Service Associations in a joint advertising campaign to promote overhaul and other service business during the winter months.

This benefit of organization, in itself, is a sufficient excuse for the organization of an association in your town. It is a fact that the automotive service business is so distributed among firms as to make it unprofitable for any one firm to advertise extensively in the papers of the larger cities. A joint advertising, not only has the advantage of reasonable expectancy of profit, but the proper working of the plan should do much toward the upbuilding of the standard of business, especially if the campaign insists upon a display of the membership in the association by a sign or by signing of the names of the interested shops to the advertisement.

# More Cars in the National Shows

## Award Buick First Choice in New York, Chicago Exhibits

**Ninety-four Cars in New York This Year—82 in Chicago, Against 87 and 80 Last Year**

NEW YORK, Oct. 8—More than 100 factory executives attended the annual members' meeting of the National Automobile Chamber of Commerce here Oct. 6 to draw space for the New York and Chicago shows. Greater interest even than was displayed last year was shown in the coming expositions.

All the applicants for space will be taken care of at the New York show which will be held in the Grand Central Palace from Jan. 7 to 13 but the situation in relation to the Chicago show which will be held at the Coliseum two weeks later is not so satisfactory.

The overflow from the Coliseum will be taken care of so far as possible in the Armory at Chicago but even these two buildings will not be adequate to meet the demand for space and several companies will be unable to make displays.

Ninety-four cars will be shown in New York as compared with 87 last year and

(Continued on page 45)

## Newmark Assures Dealers Prices Show Trend Upward

Detroit, Oct. 8—In a talk to members of the Detroit Automobile Dealers Assn. at the October meeting, J. H. Newmark of General Motors Corp. declared that price changes have now reached the lowest possible point and that from now on revisions will be upward. Many millions have been lost by manufacturers, he said, in rewriting their inventories to conform with present day market prices.

Newmark urged dealers to exert their greatest efforts in making sales at prices now prevailing, and said they could do this with the positive assurance that present values would never be bettered. He deplored the tendency to relax sales efforts in the winter months and said in no other retail business in the world was there such a seasonal let-down of effort as in the automobile industry.

On the used car situation, he said the condition was due principally to the lack of business initiative on the part of dealers. The only cure, he said, is to correct the present system of trade-ins.

## STEWART-WARNER TO APPEAL

Chicago, Oct. 10—Stewart-Warner Speedometer Corp. will make appeal from the decision handed down in United States District court Saturday by Judge Carpenter in the suit of Seager, Payton & Thomas against Stewart-Warner alleging infringement of automobile engine

vacuum gasoline feed patents obtained by James B. Seager and Norman T. Harrington. It is said that the Stewart-Warner corporation has sold approximately 5,000,000 vacuum systems at \$10 each. In the absence of C. B. Smith, president of Stewart-Warner, no other statement than that the decision would in no way interfere with the dealer organization could be secured.

## Willys-Overland to Retain About 25 Old Distributors

Toledo, Oct. 10—Willys-Overland's new distribution plan, which will become effective Nov. 1, will retain not more than 25 of the old distributors who are now under contract. In the future all Willys-Overland dealers will deal directly with the factory through branches of Willys-Overland, Inc.

## SUNNYHOME TO DISSOLVE

New York, Oct. 10—Stockholders of the Sunnyhome Electric Co., one of the units of the United Motors group of the General Motors Corp., have approved a resolution to dissolve the company. Claims must be filed by Oct. 19.

General Motors Corp. denied last May that it proposed to sell the Frigidaire Corp., the Sunnyhome Electric Co., and other units not directly connected with automotive products. It was stated then that the sale of the Frigidaire refrigerator would be extended through the sales organization of the Delco Light Co., and that the Sunnyhome Company would be consolidated with the Delco company. The dissolution of Sunnyhome is the final step in the consolidation.

## KEYSTONE ASSOCIATION STARTS

Harrisburg, Pa., Oct. 8—At a conference here of 40 delegates from all leading cities of the state, preliminary steps were taken toward organizing the Pennsylvania Automotive Assn., the completion of which will be effected at a convention in the Representatives' Chamber at the State House on Nov. 9 and 10. George G. MacFarland of Harrisburg was appointed temporary chairman at the conference and L. W. Schriener, a jobber of automotive merchandise, temporary secretary.

## DURANT TO USE AUTO-LITE

Toledo, Ohio, October 10—A contract for supply of ignition, starting and lighting equipment for its new four and six cylinder motor cars has been closed by Durant Motors, Inc., with the Electric Auto-Lite Corporation of this city. T. W. Warner, vice-president of Durant Motors, Inc., and president and general manager of Durant Motors of Indiana, Muncie, negotiated the contract with C. O. Miniger, president of the Auto-Lite, on Saturday.

## Early Fall Sales Point to Production in Easy Stride

**October Schedules Curtailed But Little, Emphasizing Assertion That Worst Is Over**

NEW YORK, Oct. 12—Summarizing conditions in the automobile field, Automotive Industries will say this week:

While it is probable sales of passenger cars will decline somewhat this month from the total for September, there is every indication that the volume of business will not show a large shrinkage. It would not be surprising if it was found that the next 30 days were approximately as good as the past 30.

Notwithstanding the unsettling effect of a large number of price reductions, shipments of automobiles in September were only four per cent less than in August, and it is significant that they were 85 per cent of September, 1920. It is probable that the October total will equal or exceed the total for October last year, and that comparisons from then on will show a balance favorable to each current month. While predictions are unsafe in a period of deflation and read-

(Continued on page 30)

## Industry's Tax Head Makes Direct Appeal to Harding

Washington, Oct. 10—Speaking for the National Automobile Chamber of Commerce, C. C. Hanch, executive vice-president of the Lexington Motor company and chairman of the taxation committee of the industry, Saturday made a personal appeal to President Harding to use his influence in fulfilling the administration's pledge of tax relief for American business. He directed attention of the chief executive to the fact that coteries in Congress were menacing economic recovering and characterized the tax plan as now proposed by the Senate and House as mere fly specks in the business situation.

The automotive industry, in common with many other manufacturers, sent its representatives to a White House conference in a final effort to obtain the support of the President to the proposed manufacturer's sale tax plan known as the Smoot Bill.

## HARDING ASKS DEALER AID

Washington, Oct. 10—Suggestion has been made by Governor Harding of the Federal Reserve Board that automobile dealers in the principal cities inquire of their banks as to what the effect of lower rediscount rates at Federal Reserve banks would be on rates of interest charged by local member banks, and then furnish the board with a synopsis of findings.



# Lighter Cars Are Feature of Paris Show

## Economical Operation Is

### Guide of French Designers

**Only Four American Makes on Exhibit—Front Wheel Brakes on 39 of the Vehicles**

BY W. F. BRADLEY

Staff correspondent of *Class Journal Co.*  
(Special Cable)

PARIS, Oct. 8.—The Paris automobile show, the second held since the Armistice, was officially opened to the public by the Minister of Public Works on Wednesday last, with a record number of exhibitors representative of the entire French automobile and accessories industries. The names of 830 exhibitors are given in the list, and of these about 80 per cent are French. Owing to the great demand for space, it was necessary to erect a special building for trucks and tractors. Only two English cars are shown. The American industry is represented by four makes of cars, namely, the Pierce-Arrow, Cadillac, Standard and Buick. Practically all of the Italian makers are showing their products.

French manufacturers are hopeful that the show will mark the end of the industrial depression, but the past 18 months have been so disastrous, that it is more a case of hopefulness than of assurance. The impression prevails, however, that after the first few days of the show a

(Continued on page 30)

## Studebaker Plans Factory Branch for Cleveland Sales

Cleveland, Oct. 8.—George E. Willis, who has been in charge of the Studebakers' export business and but recently returned from a trip to Germany and Russia, has become head of the Studebaker distributing agency in the Cleveland district. He succeeds Aaron DuRoy and Joseph O. Hahn in the active management of the Studebaker Sales Co. The following officers were elected at a meeting of directors: A. R. Erskine, president; H. A. Briggs, vice-president; George E. Willis, general manager; F. C. Kenney, treasurer, and A. G. Rumpf, secretary.

Regarding plans, Willis said, "Aside from the change in officers, The Studebaker Sales Co. of Ohio, will be conducted along the same lines as heretofore. Eventually it is the intention of the Studebaker corporation to establish a direct factory branch in this city and to liquidate the Studebaker Sales Co.

Pittsburgh, Oct. 7.—According to Aaron Du Roy, he and Joseph O. Hahn have sold their entire holdings in the Studebaker Sales Co. to the Studebaker Corp. of America. Du Roy has handled the Studebaker line in the western Pennsylvania territory since 1909. He and Hahn formed the sales company five years ago and handled the Studebaker in the state

of Ohio, western Pennsylvania and part of West Virginia, the Studebaker corporation being interested in the company. The B. F. Stout building has been leased for a long term of years to house the factory branch, which supplants the sales company.

## New York State Registers 721,488 Cars in 5 Months

Albany, N. Y., Oct. 8.—A report which has been issued by Secretary of State John J. Lyons, covering the motor vehicle registration in New York state up to July 1, when the automobile bureau was transferred to the tax commission, serves the purpose of giving the first definite figures as to what New York state has been doing in a motor way this year. In the five months' registration, the state's motor year beginning Feb. 1, there were registered a total of 721,488 cars, representing an increase of 38,569 over the total registered the previous year. Of this year's registration no less than 223,435 cars are owned and operated in Greater New York. There is a car to every 14 persons in the state. In some of the counties the ratio is one to six, while one county, Genesee, has a car to every five persons.

Up to July 1 there had been 555,179 passenger cars registered in the state, an increase of 30,908 over all of last year. The total registration of omnibuses was 28,495, an increase of 1,962. Commercial cars numbered 131,528, or a gain of 6,127 in five months over last year. Throughout the state, there has been a decrease in motorcycles.

## FRANKLIN SALES INCREASE

Syracuse, N. Y., Oct. 7.—Shipments of cars from the Franklin Automobile Co. during August and September showed an increase. The company reports that September shipments exceeded those of September, 1920, by 21 per cent. Only twice before in a 20-year period have September shipments equaled the mark set up this year.

It is also stated that August shipments amounted to 125 per cent of the shipments made during August, 1920.

## DODGE LEASES CANADA PLANT

Windsor, Ont., Oct. 7.—Dodge Brothers of Detroit has leased a wharf and building from the Canadian Pacific Railway in Windsor, Ont., and is assembling cars here. It is understood that a Canadian agency is being incorporated and the location of an automobile factory in Canada is probable.

## CHICAGO DEALERS START MEETINGS

Chicago, Oct. 8.—Regular meetings of the Chicago Dealers Assn. were opened for the fall and winter with a luncheon at the Lexington hotel at which O. W. Chamberlain, an authority on automobile selling and sales policies, addressed the dealers.

## Solons Get Together on \$75,000,000 Highway Bill

**Passage of Measure Will Aid 20 States Where Work Has Been Held Up**

WASHINGTON, Oct. 10.—Agreement has been reached in the conference of the Senate and House regarding the Highway bill and the conference report will be submitted to Congress this week. The Senate provisions were in the main accepted by the House managers and the appropriation of \$75,000,000 for Federal aid was approved. The 60-40 plan of distribution of funds was likewise retained.

The changes made in conference were of a minor character. The conference increased the percentage for administrative purposes from 1½ to 2½ per cent. This percentage becomes available first and it is to be devoted to expense incident to the administration of the act and to scientific research into highway problems. An effort was made to have the appropriations available immediately but the conference decided to make it effective Jan. 1, 1922.

The passage of this bill will do much toward stimulating highway construction in 13 states where this activity has been held up indirectly, at least, for lack of funds and in seven states where Federal aid was essential to road development.

## California Starts Work on New Speedway at San Carlos

San Francisco, Oct. 7.—Work has been started by Jack Prince, builder of speedways, on a new oval near here to be known as the San Carlos track. With the completion of this track early in December, California will have clinched her claim to the premiership among the states of automobile racing facilities.

The next race on the circuit is to be that at the Fresno oval, to be followed Oct. 23, by the 50-mile event at Cotati. For Cotati the racers will go to the Los Angeles track, where they will drive in the 250-mile championship race. Soon after this event, it is promised that the first race on the new San Carlos speedway will be held.

## DUER RUBBER CORP. RECEIVER

New York, Oct. 7.—Edward R. Duer has been appointed receiver for the Rubber Corporation of America in an action filed by the Equitable Trust Co., which holds a note for \$70,000.

Liabilities are listed at about \$900,000 and the assets are approximately \$1,000,000. It was said that the object of the receivership was to conserve the assets of the company so that it either could be liquidated or reorganized in conjunction with the Empire Tire & Rubber Co. of Trenton.

## Briscoe Motors Official Roster Carries New Names

**Directors Change but Factory Personnel Under President Earl Remains Same for Present**

JACKSON, Mich., Oct. 8—In making the announcement of the reorganization of Briscoe Motors, President Clarence A. Earl stated that the board had voted unanimously for the introduction of \$5,000,000 new capital and change of name to Earl Motors, Inc. Earl declares his company, with the progress made since March, has already signed contracts on file for more than the scheduled output of 1922. According to Earl, the additional money put into the organization means that Earl Motors, Inc., will be in the "AA" class, indicating an institutional stability comparable with the largest companies in the industry.

"In expanding our resources at this time, we are producing a new car with labor and material purchased at present-day costs. The Earl will sell in what is known as the medium price class and fill a demand that has been obvious to the industry for some time.

"It will be the policy of Earl Motors, Inc., to recognize a proper discount as essential to enable dealers to succeed and live. The old manufacturing idea was to get the cars out to the dealers and then forget any further responsibility. The readjustment period has brought about a new situation, which we know is vital to the new relationship between manufacturer and merchant."

Both the new financing and the new policies are to come before a stockholders' meeting scheduled for Oct. 20, to be fully ratified. Following this, the necessary action will be taken at Lansing to amend the company's charter to make it conform with the new order of things.

The board of directors as now constituted with Clarence A. Earl as president, consists of John Fletcher, vice-president of the Fort Dearborn National Bank, Chicago, who is treasurer; H. F. Wardwell, president of the Burnside Steel Co.; L. B. Patterson, vice-president of Edward Tilden Co.; Horace De Lisser, chairman of the Ajax Rubber Co., New York City; Wallace G. Kay, secretary and treasurer, Kay & Co., Detroit; J. Fletcher Farrell, vice-president of the Sinclair Refining Co.; J. Weissenbach, of Weissenbach, Hartman, Crain & Cormak, Chicago.

The factory executive personnel as now constituted includes: Kelly R. Jacoby, vice-president in charge of sales; J. R. Fndlater, vice-president in charge of the Pacific coast territory; Walter J. Mery, comptroller; David Minard Shaw, advertising manager; Allen T. McKay and R. N. Cowham, assistant general sales managers; Clarence L. Thurston, export manager; Victor Jantsch, chief engineer; W. B. Jameson, general factory superintendent; C. A. Woodruff, purchasing agent; J. L. Blyth, director of service; R. M. Chapman, assistant secre-

tary; Leroy C. Allen, assistant treasurer; W. M. Zerby, traffic manager; T. W. Tinkham, assistant general superintendent; John C. Baggott, eastern division manager; James T. Wiley, central division manager; Roy Coffeen, northwestern division manager; F. W. Rosche, southern division manager; T. E. Dean, midwestern division manager; C. E. Rowland, assistant eastern division manager; R. M. Burgess, southwest division manager.

## Atlanta Ford Branch Shows Sales Increase of 63 Per Cent

Atlanta, Oct. 8—The Atlanta branch of the Ford Motor Co. reports a tremendous increase the past few weeks in Ford car and truck sales, the south leading all the other districts in the percentage of gain since the latest price reduction. The increase for the Atlanta branch has been 63 per cent, and this branch now has approximately 1,000 unfilled orders on hand. A good sign of the general business improvement is the fact that there has been an enormous increase lately in the sale of Ford cars to commercial houses for the use of salesman in covering their territories.

P. A. Megahee, secretary of the Georgia Automotive Dealers' Assn., has just completed a trip throughout the state, visiting the various local dealer organizations, and reports that everywhere he visited, increased cotton prices have been reflected in increased automobile sales, especially among the smaller dealers. There is a much better feeling among the dealers in the smaller towns than there has been for more than a year, and their general opinion is that the industry is close to normalcy.

The Atlanta branch of the Goodyear Tire Co. reports tire sales running about 50 per cent better the past two months than during the same period in 1920.

## FREE GAS FOR SIX MONTHS

Sacramento, Oct. 8—F. H. Johnson, who recently took the distribution of the Oakland car in three cities of northern California, Sacramento, Chico and Marysville, has hit upon a plan to move his used cars, which he has taken in trade for new ones. With every used car he gives gasoline and oil for six months, through an arrangement with the Shell Oil Co.

"There are no strings on the offer," says Johnson. "We are making it simply to move our cars, and we are adding nothing to their price. We have made an arrangement whereby we are able to do this, and it has resulted in a decided increase in our used car sales."

## MEMPHIS SHOW A SUCCESS

Memphis, Oct. 4—The automobile show at the Tri-State Fair grounds, which opened Sept. 24 and closed Oct. 1, was unusually well attended. It was the sixth annual automobile show given under the auspices of the Memphis Automobile Dealers' Assn.

## France Closes Grand Prix to All But 122 Cu. In. Cars

**Rules Also Demand That 33 Per Cent of Competing Cars Be Manufactured Locally**

PARIS, Oct. 4—A piston displacement of 2-litres (122 cu. in.) has been adopted for the 1922 Grand Prix automobile race. The cars must weigh not less than 1653 lbs. and the distance to be covered will be about 310 mi. This rule probably eliminates all foreign competition. America is pledged to 183 cu. in. for 1922 and is not expected to produce 122 cu. in. cars until 1923. In England there will be two races for respectively 183 and 91.5 cu. in. cars, but no 122 cu. in. cars are expected from that country. Both Italy and Belgium are working on 183 cu. in. cars, and it is very doubtful, in view of the present high cost of production, if manufacturers there will build 122 in. racers also, which can only be made use of for one event. The French club has adopted as a basic principle that the race shall only be held if the competitors are 33 per cent French. With the 122 cu. in. rule for 1922, they expect a 100 per cent French race.

In addition to the speed test for purely racing cars, an interesting touring car race will be held on a limited fuel allowance. Officially known as the Touring Grand Prix, the race will be for a distance of 500 miles with four-passenger sporting type cars, minimum body dimensions, definitely stated, running on an allowance of gasoline equivalent to 13.8 mi. per American gallon. The cars will have to come to the race with engine base chambers, gearboxes and rear axles drained dry, and the necessary amount of lubricant will be deducted from the gasoline allowance. Only the driver will be allowed aboard the car during the race, but ballast equivalent to three other persons, at the rate of 154 lbs. per person, will have to be carried. No outside supplies can be taken while the race is in progress, thus the pits will be abolished.

The scene of the race has not yet been decided on, but chances are in favor of Marseilles.

## HEATERS FOR COLE CARS

Indianapolis, Oct. 7—The Cole Motor Car Co., beginning immediately, will equip its open cars with Perfection heaters. This is a step toward all-year-round service and comfort for the open car buyer.

## DAVIS PRICES DOWN \$200

Richmond, Ind., Oct. 7—The following prices are named for the 1922 models of the Davis Six, manufactured by the George W. Davis Motor Car Co., Richmond, Ind.:

	New	Old
Touring car	\$1,695	\$1,895
Fleetaway	2,050	2,150
Man o'War	2,050	2,150



## Peerless and Collins Cars Both to Be Manufactured

### New Control of Cleveland Company Not to Interfere with Detroit Plans, Says President

**D**ETROIT, Oct. 9—R. H. Collins, former president of Cadillac Motor Car Co., has returned to his offices in this city following completion of the deal by which he has acquired control of Peerless Motor & Truck Co. of Cleveland. The Peerless purchase, he said, would not interfere with plans for production of the Collins car in this city. Both lines will be made by entirely independent companies, he said, except that his connection as president of each would make them closely allied.

The Peerless purchase amounted to about \$4,500,000 and, in making it, Collins is declared to have acted solely for himself. In the reorganization meeting at which Collins was made president, the following new directors were named: Wilbur H. Collins, F. A. Tester, F. J. Miller and A. C. Earharte, Detroit; C. E. Sullivan, H. A. Tremaine, Roland Meacher, Walter C. Baker, W. H. Staring and George Siddall, Cleveland.

No new financing of the company is required, Collins said. "There is not an industrial concern in the country that I know of that is in better financial condition today," he declared. "It is carrying an unusually large cash balance and is amply provided for carrying out its plans without any further financing."

Peerless models and prices will continue without change for the present, he stated. The line will be improved and adjustments may be made in prices later, but no action along this line is under consideration at this time.

There will be no conflict between the two lines, Collins said, the Peerless being an eight-cylinder car and the proposed Collins to be a six. The latter car will be ready for exhibition at the national shows and production will be started at about show time in the factories here.

The merchandising of the two lines will be aggressively carried out, and extensive plans are now under way for their sale throughout the country. Following a brief stopover here, Collins is leaving for a trip through western and southwestern cities, where arrangements for distributorships in those territories will be perfected.

### VELIE DEALERS CONVENTION

Moline, Ill., Oct. 8—Ninety branch heads representing Velie agencies from all over the country were in sales session here last week. Comprehensive review of the 1922 outlook and plans for the forthcoming year were discussed. It was the largest and most important sales conference Velie agents have ever held.

### REPUBLIC ELECTS OLD BOARD

Alma, Mich., Oct. 8—The annual meeting of the Republic Motor Truck Co., Inc., was held in New York City Sept. 29, when 75 per cent of the stock holdings

were represented by individuals or proxies, and voted as a unit for the new board and the existing management.

The only change in the directors was occasioned by the resignation of A. H. Ide, Troy, N. Y., and the election in his stead of T. A. Burt, Urbana, Ill., representing large holdings of Republic stock in the Chicago district.

The new Board elected for the coming year is as follows:—

John N. Willys, New York; W. P. Chrysler, New York; J. E. Kepperley, New York; Frank E. Smith, St. Louis, Mich.; W. J. Baxter, New York; T. A. Burt, Urbana, Ill.; Francis King, Alma, Mich.; E. C. King, New York, and H. I. Shepherd, New York.

### TEXAS SALES SHOW INCREASE

Dallas, Tex., Oct. 8—While no figures are available for the exact number of automobiles sold by Dallas dealers during the month of September, the dealers themselves declare the business was as good as that during the preceeding months when sales records for the past 18 months were hung up. Virtually every dealer in Dallas reported business brisk with sales getting better.

As during the preceeding month the normal priced cars led in sales. High priced cars, however, were going right along and dealers said the outlook was brighter. Indications are now that the total automobile business in Dallas this year will amount to \$225,000,000 which is a considerable increase over the business for last year.

### POLICE ARE TESTING LIGHTS

Rochester, N. Y., Oct. 8—Official headlamp adjusting stations are being appointed by the police in various cities of the country with a view to a more intelligent enforcement of those provisions of state automobile laws relating to the prevention of glare from headlamps, and there are good chances that the system will be extended over the whole country. This was brought out at the recent annual convention here of the Illuminating Engineering Society.

### INDIANA SALES FALL OFF

Indianapolis, Oct. 8—Inquiry indicates that business in Indiana, in motor vehicle production and sales for September, was less in total than in August. Improvement was noted in spots and in periods. About the twentieth of the month something seemed to have a dampening effect and slowed down business in the central and the far southern portions of the state. In the western counties business continued good. In the north central counties business rolled along at about the pace noted through the summer.

### PROTEX BRINGS SUIT

Cleveland, Oct. 8—The Protex Signal Co., of this city, has filed in the common pleas court here a suit to enjoin the Simmons Manufacturing Co. and the American Signal Co., both of Cleveland, from selling a stop signal, which it is asserted is an infringement upon the patent held by the Protex Co.

## Fisk Rubber Co. Gets Tire Contract for Durant Cars

### Long Island Plant Producing 50 Automobiles a Day; Lansing Factory Starts Nov. 1

**N**EW YORK, Oct. 10—Durant Motors, Inc., has signed a contract with the Fisk Rubber Co., under which all its four-cylinder and six-cylinder models will be equipped with Fisk tires, both cords and fabrics. The clincher quick detachable type will be used. The rear wheels of enclosed jobs will be equipped with cords. No fixed number of tires is provided for in the contract, but they will be supplied, as needed.

The Long Island City plant of Durant Motors, Inc., has gone into quantity production this week and is turning out from 50 to 60 cars a day. Actual production on a considerable scale was started Sept. 27. Ten cars were turned out that day and 13 the next.

Production in the Lansing plant will start Nov. 1, as scheduled. A few men are being taken on every week in the Muncie plant of Durant Motors of Indiana, formerly the General Motors Sheridan factory. The work of redesigning the Sheridan, which will be known as the Durant Six, is nearing completion, but no date has been set for beginning production at Muncie.

### TO MAKE PORK OF ROAD HOG

Philadelphia, Oct. 8—In response to the launching of a campaign against the "road hog" by the Motor Truck Assn. of Philadelphia, Benjamin G. Eynon, registrar of motor vehicles for the Pennsylvania State Highway Department, has written to W. H. Metcalf, secretary of the association, stating that the department is anxious to lend its cooperation and place the automobile division at the disposal of the association in trying to eliminate motor truck violations of highways regulations. A large number of members of the association are noting conditions and sending in reports to the association, stating the number of each offending truck and the occasion of the offense. A copy of each report is forwarded to the offending truck owner. Many such owners have sent letters of thanks for having the matter called to their attention.

### I. E. S. DISCUSSES LIGHT QUESTION

Rochester, N. Y., Oct. 9—The improvement of illumination of automobile headlights was one of the subjects discussed at the annual national convention of the Illuminating Engineering Society which was held here recently. The report of the committee on motor vehicle lighting, entitled "Present Status of Automobile Headlighting Regulation," was read, and it was stated that the regulation of automobile head lighting in accordance with the I. E. S. system had made considerable progress. The following states have adopted it: New York, California, Pennsylvania, Connecticut, Maryland and Wisconsin.

## New England Takes Lead in Uniform Vehicle Law Drive

Conference in Boston Attended by Many Related Industries—Carolinas Also in Campaign

BOSTON, Oct. 7—As a result of a recent conference held here by representatives from the New England states and from New York, this section of the country seems to be elected to lead in the campaign for uniform motor vehicle laws. The conference resulted from the pioneer work done by James T. Sullivan, member of the Bay State A. A. and automobile editor of the Boston Globe. Nearly every interest that might be expected to take part in securing a uniform law was represented at the conference.

The department of public works was represented by John H. Cole, of Massachusetts; the state highway department by Paul O. Sargent, of Maine; the Motor Vehicle Conference of New York by Harry Mixell, Jr.; the National Automobile Chamber of Commerce by D. C. Fenner; vehicle registration departments by Frank A. Goodwin, of Massachusetts; police departments by Capt. Bernard J. Hoppe, of Boston police department, and the lighting interests by Professor William J. Drisco, of M. I. T.

It was the sense of the conference that all these interests should firmly support the proposed uniform vehicle law.

### APPERSON IN RECORD RUNS

Los Angeles, Oct. 8—An Apperson car for the second time in two weeks is claimed to have smashed the world's records for sustained time. The following information is sent out from the Apperson branch in Los Angeles:

"In an official test on Los Angeles Speedway, Sept. 10, an Apperson Eight stock car, equipped with stock body, created a world's record for 40 hours by making 69 laps of the track at 86 1/4 miles in one hour.

"The record previous to the above feat was also accomplished by an Apperson. Less than two weeks before it maintained an average speed of 75 miles an hour for 40 hours on the same track, making 2757 miles. The race was official in every sense of the word, for the car was locked up by the speedway officials and all records came directly under their supervision."

### CLEVELAND PROPOSES BIG SHOW

Cleveland, Oct. 8—A new municipal auditorium will house the 1921 Cleveland automobile show, which will be held Jan. 21 to 28. The building, which is now being completed, was erected by the people of Cleveland at a cost of more than \$5,000,000.

Fred H. Caley is show manager for the Cleveland Automobile Manufacturers' and Dealers' Assn., the board of directors of which is composed of the following: G. G. Peckham, Ohio-Buick Co., president; F. E. Stuyvesant, Stuyvesant Motor Co., first vice president; C. S.

Carris, Carris-Franklin Co., second vice president; Robert J. Schmunk, Peerless Motor Car Co., treasurer; Fred H. Caley, secretary and manager; C. A. Forster, Packard-Cleveland Co.; R. C. Simmons, Simmons Motor Car Co.; M. B. McLaughlin, White Motor Co.; Frank N. Sealand, Sealand Motor Co.; H. O. Secrest, Detroit Electric Car Co.; T. H. Towell, Cleveland Cadillac Co., and Otto C. Tyner, Jordan-Ohio Co.

## Plan Uniform Law in Carolinas

CHARLOTTE, N. C., Oct. 9—The Carolinas Automotive Assn. is preparing a new bill to be submitted to the extra session of the State legislature, which meets in December, providing a uniform vehicle and automobile theft law. Lee Folger of the C. C. Coddington Co., and W. M. Jones, secretary of the Charlotte Automotive Assn. will have charge of the legislation before the legislature.

## Second Arrest Follows in Wake of Revere Settlement

Indianapolis, Oct. 8—J. R. Porter, a Buffalo broker, was arrested at Logansport last Friday at the request of the police of Erie, Pa., on charges of extortion. Several weeks ago Porter filed charges of grand larceny against Newton Van Zandt, former president of the Revere Motor Car Corp. Porter said he would waive extradition and return to Erie when officers from that city arrived. He will say nothing concerning the charges against him.

Prior to his arrest, Porter appeared before the Cass county grand jury which is investigating the affairs of the Revere corporation, now in the hands of a receiver. He appeared as a stockholder of the company.

Van Zandt contends that he never met Porter but that the Buffalo man bought 330 shares of Revere stock from another broker for \$8 a share. Van Zandt says that after he retired from the company several months ago, Porter wrote him a letter saying that he had resold the stock to a client who could not afford to lose the money which resulted from the decline in the value of the stock following the financial difficulties of the company. Van Zandt declares Porter wanted him to make good the difference but that he declined to do so because it might establish a precedent for many cases of the kind for which Van Zandt was not in any way responsible.

A release from liability given Van Zandt by the Revere corporation came to light last week. Van Zandt is now in New York and his friends assert that he was not in any way responsible for the difficulties of the Revere corporation.

## Bonded Buses to Have Big New Terminal in Portland

Station Will Have Conveniences of Modern Railway Depot—Operators Back Plan

PORTLAND, Ore., Oct. 8—All stage operators who run buses in Portland and from Portland to points outside must have each stage bonded for the sum of \$10,000, according to an ordinance which was introduced in the Portland city council this week. The ordinance was drafted at the request of City Commissioner Mann, in charge of public works, and is considered certain of passage.

Construction of an automobile stage depot covering a quarter of a block in the heart of the business section will start next month, and the depot will be ready for occupancy by the first of the year. The station will be similar to railroad stations in many ways, with a drive-in for cars, and with ticket windows, announcers and all the other conveniences. A cooperative association has been formed by the bus operators for the purpose of erecting the depot, which will cost \$40,000, and over 90 per cent. of the operating companies are now in the cooperative association. It is estimated that when the new depot is in operation, a stage will leave the station bound for some point outside the city of Portland on the average of one every five minutes during the waking hours.

### THREE ANDERSON MODELS

Rock Hill, S. C., Oct. 10—The Anderson Motor Co. has brought out three different variations of a four-passenger sport model.

The regular sport touring model consists of standard chassis, four-passenger "Coachbilt" sport body with black or brown upholstery and wooden wheels.

The "Morris Special" sport model has red leather upholstery, four aluminum steps and full nickeled lamps finished with vertical nickeled rods on the back of the tonneau.

The Ultra Sport is distinguished by disk wheels, (six being supplied and wire wheels optional) with cord tires, aluminum steps in place of running boards, full nickeled lamps, khaki top special semi-California type, and a portable tourist trunk fastened on the rear.

### WILLYS' MOLINE INTERESTS DILUTED

New York, Oct. 7—Since the plan for the reorganization and refinancing of the Moline Plow Co. was announced, there has been persistent reports that "Willys is out of Moline." It can be said on authority that John N. Willys personally never was interested in the plow company except as a subsidiary of the Willys-Overland Corp. Under the reorganization, Willys-Overland will retain its equity in the Moline Plow Co., but as one of the bankers interested expressed it, "this equity will be considerably diluted."



## Movies and Music Aids to Tractor Salesmen in Texas

### Fordson Demonstration Crews Tour State in Educational Campaign Among Farmers

HOUSTON, Tex., Oct. 7—Of the various ways to interest farmers in tractors and make sales, which the Ford dealers of Houston have adopted, a plan is in use, which tractor people in this section are watching with more than passing interest. The Ford branch factory here is taking the tractor to the farmer and showing him what it will do. Music and motion pictures are to have their part in the demonstration.

This week the Ford branch house sent out two crews of seven men each with Fordson tractors. One of these crews will work in the southeastern section of the state, or the rice belt, while the other is working in the southwestern section of the state, the general farming, ranching and truck sections. The crews will remain with the farmers for the next 60 days, actually demonstrating what tractors will do.

Under the present arrangements the crews will remain at one place for a day and a half, during which time the tractor may be hooked up to any of the farm machinery and made to perform.

The motion pictures are for night work and are calculated to provide amusement for the people. Scenes of farming with tractors and other modern farm implements in use and the results of the use of those implements will be shown. A phonograph is sent with each crew and a Magnovox goes along for magnifying the voice 20 times.

### LINCOLN WAY SNOW FREE

Sacramento, Oct. 8—The Lincoln Highway over the Sierra Nevada mountains is to be kept free from snow, and open for travel all winter, according to an announcement of Gale S. Hoag, Field Secretary of the Lincoln Highway Assn. Hoag says a rotary snow plow, similar to those used by railroads, pushed by a tracklaying type tractor, will be used.

Heretofore the highways over the mountains to the east have closed with the first heavy snows of early winter, to remain closed until about the first of June. Hoag believes travel will now be possible the year round, and the tourist crop can be harvested every month of the year.

### DORT DEALER CATCHES PROSPECTS

Boston, Oct. 10—More than 3000 men and women have visited the salesrooms of the Utterback-Gleason Co., Dort distributor, in the past two weeks to register their estimate of how much gasoline is held in a large glass jar, and how long a Dort car will run with the contents of the jar. The prize for the winner is a new Dort coupe. The contest closes next Wednesday.

Officials from the Brookline department of weights and measures sealed the jar and noted its contents. All the esti-

mates are placed in the Dort coupe to be given away. In case two persons make the same nearest estimate when the car is given its test, the one who first signed a slip will get the vehicle. From the thousands of people who called, the salesmen have had a chance to talk Dort to hundreds and they have many excellent prospects. They have also made some sales among the callers.

### Cleveland Dealers Share Enclosed Car Prospects

Cleveland, Oct. 8—Cooperative effort on the part of Cleveland automobile retail dealers has gone the limit in the effort to make a success of enclosed car week here Oct. 12 to 22. Final arrangements for the exhibit were made last week. The exhibit is to be under the management of the Cleveland Automobile Manufacturers' and Dealers' Assn.

During the week in question, dealers are to invite prospects entering their stores to view exhibits, to enter their cars and be driven to the showrooms of their competitors. They are not going to take the prospects over to knock the competitors' cars. They are going to do it to accommodate the persons who want to view more than one exhibit and have not the means of transportation at their disposal. It will boost the attendance. Since every dealer here is certain that his own car and line is the best, no dealer has anything to fear.

### OHIO LAMP LAW IMPRACTICAL

Toledo, Oct. 9—More than \$100,000 has been spent by Toledo motorists for new headlights to conform to the requirements of the Pence lens law.

A questionnaire is being sent out to 650,000 motorists members of the large automobile clubs of the state, asking their opinion on the law and its effectiveness. It is said that it is impractical and impossible to test the 700,000 motor cars for headlight focus and distribution of light and arrest those who are violators.

A movement for the repeal of the law will probably be made at the next session of the legislature next year.

The attorney general has ruled that the Pence law does not touch manufacturers and does not require them to affix a law-abiding lens or focus lamps before the car is sold.

### MEMPHIS FAIR RACES

Memphis, Oct. 8—The automobile races were the features of the opening day of the fourteenth annual Tri-State Fair here Sept. 24. Jules Ellinboe, Memphis driver, was the star of the first day's races, heading two summaries in match events. He set a record for the new half-mile track. This was at a mile distance, and the timers hung out .30 2/5 and 1:01 2/5 when he crossed. It was masterly driving that enabled Ellinboe, seated in a Frontenac, to beat out Eddie Hearne, Lon Corum and other well known racers. The record breaking machine is the same which Tom Milton drove at the Indianapolis 500-mile classic this season.

## Better Methods Paramount to Greater Business Volume

### Moock of N. A. D. A. Tells Buckeye Dealers Waste and Extravagance Precede Amazing Revelations

CINCINNATI, Oct. 8—Not more business, but better methods, was the chief subject discussed by Harry G. Moock, general manager of the National Automobile Dealers' Assn., who was the guest of the Cincinnati Automobile Dealers' Assn. at the October trade revival meeting here.

Moock declared that concentrated effort in locating waste resulting from extravagant habits contracted in the hilarious days following the war, would result in amazing developments, if merchants would make close examination. This, he said, applied not only to automobile dealers, but to all other merchants.

Speaking specifically about the automobile merchant, Moock said that the customer's desire to own an automobile is still as pronounced as it always has been, and continued increases in the total registration of motor cars can be expected for many years to come.

Better service, not the mere desire to use the term to attract attention, but courteous, prompt, economical attention to the customer's wants, will do much toward establishing good will and character building in business, without which no business house can succeed.

Speaking of the legislative and tax situation, both nationally and state-wide, Moock stated that the taxes paid by the automotive industry, based on the 1920 compilations, amounted to the enormous sum of \$366,720,878. In 14 states, however, there is now a gasoline tax being paid by motorists, adding to the already heavy burden some \$6,000,000. The greater the tax, the greater the sales resistance.

### HAVE UNIFORM RULES

New York, Oct. 9—A subcommittee of the executive committee representing the tire manufacturers division of the Rubber association is still engaged in working out general recommendations for tire manufacturers on the subject of mileage guarantees and the protection of prices. When the deliberations of the committee are completed, it is hoped there will be a greater uniformity of practice. Consideration of these subjects will be continued and final reports are hoped for within a comparatively short time.

### PAIGE DEALER ENTERTAINS

Hartford, Conn., Oct. 10—F. W. Williams, distributor of the Paige in northern Connecticut, entertained 80 of his salesmen, service men, sub-dealers and friends at Lake Compounce, Sept. 19. An automobile parade was a feature of the occasion. A. W. French of Hartford headed the parade in his 1912 Paige, which he has driven 100,500 miles. Following the dinner there was an extensive athletic program.

## CONCERNING MEN YOU KNOW

R. Scott Smith, Jr., manager of the Camden, N. J. branch of the Neel-Cadillac Co., of Philadelphia, has been promoted to sales manager of the company at Philadelphia. John B. Keefer has succeeded Smith as manager of the Camden branch.

J. M. Friedman has been appointed retail sales manager of the Curran-McDevitt Motor Co., Inc., Philadelphia, which merchandises the Mercer car for eastern Pennsylvania, southern New Jersey and Delaware.

H. M. Weathers, formerly of the Orridge-Weather Co., Greensboro, N. C., has become connected with C. C. Coddington Co., Inc., Charlotte, and will travel the territory of that concern, distributor for the Buick.

F. B. Norman, who for some time has been at the head of the F. B. Norman Co., Wilmington, Del., a large Ford agency, has been elected president and general manager of the Wilmington Automobile Co. He succeeds Harry T. Graham, who becomes chairman of the board of directors. Graham succeeds John J. Raskob, an officer of the General Motors Corp., who has resigned both as chairman of the board and as a director. Raskob, it is understood, retained his interest in the company, however. The company handles General Motor lines.

Fred H. Williams, general manager of the Philadelphia office of the White Co., has named Frank W. Beirn, for several years sales manager in Philadelphia, as manager of the Wilmington branch. Louis Klee, whom he succeeds here, goes to the Philadelphia headquarters in a special sales capacity. C. W. Squires, Jr., is the new Philadelphia territorial manager. He has been connected with the company for a long time.

Holt Manufacturing Co., Peoria, Ill., has appointed W. A. Bickel district manager in charge of the consolidated territory of Iowa and Nebraska. Bickel has, for the past year, been district manager in charge of the Des Moines branch. He will now make his headquarters at the Omaha branch, and the consolidated districts comprise the states of Iowa, Nebraska and the southern part of South Dakota.

R. Scott Smith, Jr., manager of the Camden, N. J. branch, has been appointed sales manager of the Neel-Cadillac Co., Philadelphia. Smith is succeeded as Camden branch manager by John B. Keefer, who has been a member of the Neel-Cadillac sales force since 1917. Clayton S. Staley, who was in charge of the office in Camden, has been placed on the new car sales force of the Camden branch. Announcement is also made of the return of E. R. Fearnside to the Neel-Cadillac sales force, Philadelphia.

Charles E. Wagner has joined the sales staff of the Maxwell Motor Sales Co. and Chalmers Motor Car Co. He had been with Willys-Overland for nine years, serving in many capacities from factory representative to distributor.

T. M. House, Spokane, Wash., has taken over the distribution of Ruggles trucks for the Pacific coast territory.

### SOUTH BOOMS AS COTTON SOARS

Atlanta, Oct. 8—Concrete evidence that general business conditions in Atlanta and throughout the Sixth Federal Reserve District, which comprises the southeastern area, are at the highest mark since the first of this year, is furnished in the monthly statement issued by the Federal Reserve Bank of Atlanta the latter part of September. All lines of wholesale and retail trade show material improvement and there is every promise that normalcy is close at hand, according to the report.

Among Atlanta dealers and distributors of motor cars and trucks this bet-terment is being felt in increased demand, especially in the rural districts.

September bank clearings in Atlanta were almost \$30,000,000 larger than clearings during August.

### DID NOT ASK ILLINOIS CHARTER

New York, Oct. 10—Durant Motor organization considers the fact that since it is now in quantity production, sufficient answer has been made to the contention of

Paul Donald Brown, Indianapolis, advertising manager of E. W. Steinhart & Co., distributor for the Cadillac, has been elected secretary of the Indiana Kiwanis Clubs.

E. B. Jackson, former vice-president in charge of sales of the Willys-Overland Co., at Toledo, has become associated with C. H. Wills & Co., Marysville, Mich., in the distribution of Wills Sainte Claire automobiles.

H. R. Sturgeon, who was connected with the John N. Willys Export Corp., New York, as advertising manager, and previous to that time had been in the advertising department of the Willys-Overland Co., at Toledo, is now associated with the John O. Munn Co., as vice-president. The Munn company specializes in advertising and merchandising service for automobile dealers.

H. D. Spaulding, timekeeper, resigned from the Willys-Overland Co.'s employ this week after serving in the shop continuously since February 14, 1896, when the plant was occupied by the Lozier-Yost Bicycle Co.

H. J. Edwards has been appointed supervisor of the Detroit district for the Maxwell Motor Sales Corp. and the Chalmers Motor Car Co. Edwards has had a wide experience in sales organization work. He was connected for many years with the Union Carbide & Carbon Co., both as sales manager and as general manager of several of their subsidiaries, notably the Prest-O-Lite Co. Prior to that, he was eastern manager for the Moline Plow Co.

J. S. Cooper, who has been in charge of the truck department of the Wabash Auto Sales Co., Terre Haute, will leave in a few days for Phoenix, Ariz., to be with Mrs. Cooper, who has been in ill health for some time.

M. P. Barnes, district manager for Sacramento of the California Automobile Assn., has resigned the position he has held for four years, and will rest, in the hope of recovering his health.

United States Motor Truck Co., Cincinnati, has declared its regular quarterly dividend of 1 3/4 per cent. Business with the company is said to be better than at any other period within the last eight months.

Arthur Rodrian has been named manager of the Columbus Automobile Club to succeed Carl Mueller, who resigned recently. Rodrian has been a salesman for the Anzor-Hoel Co., jobbers of accessories and was also a trustee of the club.

J. Walter Drake, president of the Hupp Motor Car Corp., and official of the National Automobile Chamber of Commerce, has been named a member of a committee of trade and crafts organizations to confer with the Bureau of Census regarding a general schedule for manufactures for the census of 1921.

E. F. Blank, safety director of the Buick Motor Co., Flint, has been appointed chairman of the automotive section of the National Safety Council, and M. K. Averill of Dodge Bros., secretary.

the Illinois Securities Commission, which has refused to allow the sale of Durant stock in that state on the ground that it is purely speculative. It might be stated that no federal application was ever made for permission to sell in that state, although inquiry was made as to what procedure was necessary and some stock was sold there. The report from Springfield, Ill., that Durant Motors was refused incorporation papers is without foundation.

### AMERICAN BOSCH'S NEW HOME

New York, Oct. 8—The new home of the New York branch of the American Bosch Magneto Corp. is a 10-story building erected in the center of automotive sales and manufacturing interests in the city. Four of the floors are occupied by the corporation and the upper parts of the building will be rented exclusively to automotive concerns. A large service station and installation garage is located in the basement, and the sales and stock rooms, occupying the ground floor, are spacious.

## Seiberling Tells Plans to Recrown Self Rubber King

### Hopes to Build Most Efficient Plant in the World—Predicts Startling Scientific Developments

CLEVELAND, Oct. 9—Frank A. Seiberling, of Akron, former president of the Goodyear Tire & Rubber Co., has given out some of his plans for industrial regeneration. Seiberling already has acquired plants which will provide 5000 casings and 6000 inner tubes daily.

"I have acquired a plant at New Castle and have made an offer for the Portage Rubber Co. near Akron. With these two plants we would have a capacity of 5000 casings and 6000 tubes a day. I am proposing to take over the Portage plant for \$750,000. It will be paid in preferred stock of a corporation to be organized to own that plant. The common stock of the Portage plant will go to a holding company that I am organizing for operating purposes. The holding company will own the New Castle plant in fee, having paid for it in common stock at its present appraised value."

### 30,000 STOLEN CARS IN 1920

St. Louis, Oct. 8—Thirty thousand and forty-six automobiles were stolen in 1920 in 28 "index" cities of the country, and 21,273 of them recovered, according to the annual compilation of the National Automobile Dealers' Assn. The number stolen was 3,012 less than the number the number stolen in 1918. In 1918 cars unrecovered were 21 per cent of the number stolen; in 1919 they were 26 per cent and in 1920, 29 per cent.

### WIRELESS TO STOP THIEVES

Harrisburg, Pa., Oct. 8—Major Adams, superintendent of the State Police, will install a wireless telephone apparatus on the State Capitol building, connected with police headquarters here. From this central location messages will be sent out four times a day to police headquarters in all cities and towns in Pennsylvania which install wireless stations. This, if it works out as expected, will prove a deterrent to motor car thefts and other crimes and will result, it is believed, in the capture of most criminals braving the system.

### CLEVELANDERS FIGHT TAXES

Cleveland, Oct. 8—Aroused by the fact that the proposed Federal taxes on the automobile industry will take between \$4,000,000 and \$5,000,000 from the consumer and others in the industry in this city, the trade has started a determined fight to have Ohio congressmen and senators commit themselves to a modification of the so-called Mellen plan and the adoption of "equitable taxes."

### LOUISVILLE SHOW FEB. 20

Louisville, Ky., Oct. 8—The fourteenth annual automobile show will be held Feb. 20 to 25, under the auspices of the Louisville Automobile Dealers' Assn.



## IN THE RETAIL FIELD

Dail-Overland Co., Charlotte, N. C., distributor of the Willys-Overland product, is one of the four agencies in the country retained by the parent company under the new distribution policy of that concern. The local company has about 70 counties in North Carolina.

Carolina Automotive Assn. is preparing a membership campaign. An effort will be made to secure membership of all eligible dealers in towns where an association has been organized. The association hopes to double its membership by this campaign.

William and Thomas Waugh, Peoria, Ill., have opened the Jefferson garage and introduced a novelty in the way of car washing by compressed air and steam.

Killeen-Buick Co., Galesburg, Ill., has launched a sales campaign, asking one-fifth of the cost as first payment on a car and the remainder in 12 monthly payments drawing 6 per cent interest. Used cars are sold on the same terms excepting that the interest is 7 per cent. Large space is being taken in the newspapers to exploit this campaign and it is producing excellent results.

Moore Automobile Co., Greenville, S. C., has opened a salesroom and service station for Liberty Six and Jordan cars. The company is state distributor for these two cars, with offices and salesrooms in Columbia and Dillon. The firm will distribute cars in the territory of upper South Carolina and southwestern North Carolina.

Standard Motor Co., Winston-Salem, N. C., has secured the agency for the Lincoln car, and will distribute that car in this section.

Franklin Motor Car Co., Asheville, N. C., has been chartered to deal in automobiles, etc. Capital stock is \$50,000. J. E. Brookshire, C. M. Williams and Wayne Beachboard are the incorporators.

Economy Motor Sales Co. has taken over the distribution of Chevrolet motor cars in Cuyahoga county. These have been distributed since 1916 from a direct factory branch in Cleveland. The officers of the new company are: Joseph J. Hengesbaugh, president and general manager, Stephen Domonkas, vice-president and treasurer, Louis Charvez, secretary and assistant general manager. Hengesbaugh and Domonkas have been owners of the Buckeye Motor Sales Co., Chevrolet dealers since 1917. Charvez has been manager of the Cleveland Chevrolet retail sales store for the past year.

Philadelphia interests of the Locomobile Company of America will be carried on, as for the last 17 years, by the Philadelphia branch, which will move from Market street into new quarters.

King Motor Sales Co. has opened new salesrooms in Philadelphia. F. S. Dymond is president of the company and Walter S. Wheeler is vice-president and manager of the service department.

Arthur P. Hawes, for five years branch manager for the Locomobile in Philadelphia, has been elected vice-president of the H. C. S. Sales Co., Philadelphia, distributor of H. C. S. cars.

Potter-Diesinger Motor Co., Philadelphia, which handles the Fiat, has added the Elgin Six for the territory embracing eastern Pennsylvania, southern New Jersey and Delaware. Dealers and sub-dealers will be immediately appointed.

Jackman Motor Co., Joliet, Ill., has been sold at public auction, following the recent action of the courts in declaring the concern bankrupt. A schedule of the company's assets indicated a sum of approximately \$100,000, while the liabilities total \$130,000.

Horace G. Marsh has been appointed South Jacksonville agent for the Ford Motor Co., according to a recent announcement by Slocum Ball, Jacksonville manager of the Ford company. The Burwell Motor Co.'s present agents will be transferred to Jacksonville proper.

George G. Cover, Rochester, and W. D. Kitchell, Geneva, have purchased the Buick and Lincoln automobile agencies at Geneva, N. Y., including buildings and equipment. The new corporation has elected W. D. Kitchell president, J. S. Kitchell, vice-president, and George G. Cover, secretary-treasurer.

Edward Tompkins has leased the D. S. Coggins garage at Hopedale, Ill., and will take care of the repair department. Coggins reserves the accessory department.

Franklin Agency—An independent agency to distribute the Franklin car has been opened at Aurora, Ill., and that city will no longer be a branch of the Chicago office.

C. T. Vaughn has purchased a half interest in the Moline-Knight Sales Co., Decatur, Ill., and will be associated with R. F. Beach in the operation of the business. Vaughn was formerly manager of the Case service station in Decatur.

National Automobile Co., Chicago, distributing accessories of various kinds, has opened a branch at Peoria, Ill.

Sorg Motor Car & Truck Co. has succeeded the W. D. Block Motor Car Co. as Detroit distributor of Marmon.

William Rountree, formerly of Dallas, has bought the interest of his former partner, W. G. Burton of Fort Worth, and the Burton-Rountree Auto Co. of Houston, Tex., agents for the Chandler. The new firm is now known as the Rountree-Abbott Motor Co., T. F. Abbott, formally acquiring the interest of Rountree.

Homer Williams Motor Sales Co., Terre Haute, Ind., has been given the agency for the Stephens automobile. With this latest change Williams is now distributor in this territory for the Auburn and in 13 counties for the Stephens automobile.

## Dunkle Motors Co. Plans to Handle 12 Lines of Cars

Overland Dealer, Columbus, Ohio, to Open Separate Salesrooms with Central Service Station

COLUMBUS, O., Oct. 8—C. T. Dunkle Motors Co. has been chartered for the purpose of establishing a central service station and public storage garage in Columbus. C. T. Dunkle, who is at the head of the Overland-Dunkle Co., Columbus distributor for the Overland and Willys-Knight, is at the head of the new concern. It is planned to distribute about 12 makes of cars throughout Ohio and to establish in Columbus separate salesrooms for the various lines.

The centralized service station will cater to all of the cars, and in that way it is hoped to operate the service station more economically. Contracts have been signed to handle several lines, and others will be closed soon. The incorporators of the new company are C. T. Dunkle, T. S. Hoff, C. A. Augustine, C. F. Shockler and Mrs. C. T. Dunkle.

## FORD DEALERS MEET

Atlanta, Oct. 8—The annual convention of the Ford dealers under the jurisdiction of the Atlanta factory branch of the Ford Motor Co., comprising Georgia, Alabama and East Tennessee, was held here the last week in September. About 240 dealers attended, and W. W. Mitchell, manager of the branch, presided. The convention was essentially a "get-together" affair, devoted mainly to a discussion of the business outlook, future plans, and business conditions the past few months.

## LIBERTY MOTORS NAMES DEALERS

Detroit, Oct. 8—Liberty Motor Car Co. is increasing its dealer organization, following a change in distribution plans affecting several important localities. Latest appointments include dealerships in Syracuse, Houston, Wilkes-Barre, Pittsburgh, Springfield (Ill.), Terre Haute, Vincennes, Danville, Troy and Windsor, Ont. Spotty business conditions are found by the company throughout the country, though southern business as a whole is reported better.

## OVERLAND TAKES HARPER HOLDINGS

Philadelphia, Oct. 8—In keeping with the policy of the Willys-Overland Co. Inc., to take over factory branches and the distributing agencies of all its dealers throughout the country, Harry B. Harper, president of the Overland-Harper Co., this city, distributor of Willys-Overland and Willys-Knight cars for the last four years today turned over his large holdings in this city to the factory. These holdings include the repairshops, taking in an entire block, the retail salesrooms and the company's branches at Atlantic City, Chester, Reading, Trenton and Dover.

## Kentucky Dealers Strong For Accessory Sales Drive

Louisville, Oct. 8—Automotive dealers here have started to put into operation the "sales promotion" plans of the Automotive Equipment Assn., and are also going to carry along with that an effort to put over a Kentucky automotive trade association.

Recently Ray W. Sherman, merchandising director of the A. E. A., and L. M. Shaw, executive secretary of the Indiana Automotive Trade Assn., sold those two ideas to the Louisville trade. More than 100 men interested in the automotive industry were present for the dinner. Sherman first told the story of the movement which he is directing and then sold the idea of how the dealer can put it over. It was quite evident from the spontaneous expressions of the dealers following Sherman's close that the movement would be adopted here.

It is understood that the N. A. D. A. has approved plans for an immediate campaign in Kentucky.

## INDIANA ORGANIZING DEALERS

Indianapolis, Oct. 8—Intensive organization work in the fall pre-convention campaign of the Indiana Automotive Trade Assn. is well under way. The campaign calls for widespread activities and means a busy time for L. M. Shaw, executive secretary. It is also announced that Harlow Hyde, formerly advertising manager for Nordyke & Marmon Co., has joined Shaw's office as business and advertising manager, taking active charge of the state organization's monthly publication.

## SLOW NOTES CAUSE FAILURE

Detroit, Oct. 8—W. D. Block Motor Co., Marmon and Lexington distributor of this city, has filed a bankruptcy petition in federal court, setting forth liabilities of \$261,691.67 and assets of \$127,294.11. In the petition as filed by Louis F. Dahl-ing, it is declared that "many defaults are occurring in the payments of notes, and it is necessary that collection be enforced or the cars recovered from defaulting purchasers." The Security Trust Co. has been named receiver.

## Economical Operation Is Guide of French Designers

### Only Four American Makes on Exhibit—Front Wheel Brakes on 39 of the Vehicles

(Continued from page 23)

real buying campaign will set in. Manufacturers insist that if the government would remove the present high taxes on gasoline a great impetus would be given to trade. In a technical way, much effort has been made by the French industry to attract buyers.

In view of the fact that the public desires greater economy of operation, practically all makers are producing smaller and lighter designs. The dominating type at the show is a light, 4-passenger, 4-cylinder car of 120 cu. in. piston displacement or less, with a nominal rating of 10 hp. Some of the firms which have always been catering to the high class trade and never previously have built cars of this type, have entered this class. Panhard, for instance, offers a 4-cylinder Knight-engined car of 60 x 105 mm. cylinder dimensions (2.36 x 4.13 in.). Voisin also shows a 4-cylinder Knight engined car, of 60 x 110 mm. cylinder dimensions (2.36 x 4.33 in.). Darracq, Delage, Delaunay-Belleville, Delahaye and Chenard-Walcker are other firms building smaller cars than they have ever turned out before. Citroen, while continuing his present model, has placed on the market a 5 hp. 2-seater with a 4-cylinder 55 x 90 mm. (2.16 x 3.54 in.) engine which sells complete for 8500 francs (\$653 on the basis of the current rate of exchange). For the manufacture of this car Voisin has secured control of the Clement-Bayard factory.

Very few reductions in price have been announced, the makers declaring that rock bottom figures have been reached, and it is believed that competition is causing some of the smaller makers to sell below manufacturing cost. The price of the Citroen 4-seater is now 13,900 francs (\$1,000).

Talbot-Darracq has put out a 12 hp. 5-passenger car at 22,000 francs (\$1,585), this being one of the cheapest 6-cylinder models shown. The Lorraine-Dietrich 6-passenger sells at 28,750 francs (\$2,075). Fiat has reduced the price on the 10 hp. 4-passenger model to 21,500 francs (\$1,550).

Four-cylinder models are in a greater majority than at any time in recent years and are followed by the 6-cylinders. Only two 12-cylinder models are being exhibited, a luxury type Voisin "12" with an all-aluminum engine of the Knight sleeve-valve type and a Fiat "12" with overhead valves and the camshaft in the crank chamber. Lancia, another Italian maker, is showing an 8-cylinder chassis which has the peculiarity that the two cylinder blocks of the V-engine make an angle of only 14 deg. with each other. Bugatti, who claims to have been the first to turn out an 8-cylinder in-line engine of 3 litres (183 cu. in.) piston

displacement, is showing a sport model of this type. Panhard is showing a new 8-cylinder in-line, Knight-engined car and Fonck also shows an 8-cylinder in-line model. No other multi-cylinder engines have made their appearance. Ballot is marketing duplicates of his 2 litre (122 cu. in.) racing jobs with sport bodies.

The most outstanding feature of the show is the use of front wheel brakes by 35 different firms, 23 of which are working under Perrot license. Bugatti, Rolland-Pilain and Voisin are using hydraulically operated brakes, while on the Slim car compressed air is used for applying the front brakes. Among the important firms which have recently

## Athletic Field at Filling Station

*Kirkersville, O., Oct. 8—C. C. Bricker, a garageman, has just completed a modern filling station at this place, which is located on the National Road about 25 miles east of Columbus. In addition to a building, 20 by 26 ft., which contains all modern conveniences, Bricker has installed lunch tables for tourists as well as croquet courts and horseshoe pitching courts. The location of the filling station, in the edge of a forest, makes these innovations both pleasant and profitable.*

adopted front wheel brakes may be mentioned Panhard, Fiat, Hotchkiss, Rochet-Schneider and Farman. There are several instances in which front brakes are fitted to chassis with a rating of 15 hp. or less, and buyers in a great many cases now insist on these brakes. Servo brakes, by which is meant brakes which are operated by other than muscular energy, are used on several cars, including the Ballot, Panhard, Bignan and Chenard-Walcker. The Ballot servo brake, with which it is impossible to lock the wheels, is used by Chenard-Walcker and Bignan. There is a slight increase in the proportion of overhead valve engines, the overhead valve design being used particularly in conjunction with detachable cylinder heads. Most of the overhead valves are operated by pushrods. The great majority of the entirely new models are fitted with Delco electric equipment, but none of the modified or remodelled cars take this equipment.

Three-speed transmissions are coming into more extensive use on the more powerful cars, while the majority of the cheaper and smaller models retain the four-speed gearbox. A great deal of development work seems to have been done on springs. Only three firms—Berliet, Lorraine-Dietrich and Bellanger—are adhering to the American type of car with large engine and of cheap production, whereas all of the other makers are turning out the European type of cheap car with the smallest possible engine.

## Early Fall Sales Point to Production in Easy Stride

### October Schedules Curtailed But Little, Emphasizing Assertion That Worst Is Over

(Continued from page 22)

justment, there appears to be little danger in asserting that so far as the automotive industry is concerned the worst is over.

The slight falling-off in business last month was in the lower and medium-priced cars, and almost without exception the companies making cars in the higher priced classes had material gains in business. Orders for high-priced cars continue to come in on a basis which indicates that the September gain in sales will continue this month.

Production schedules for October have been curtailed in only a few instances, although production will be kept strictly to a sales basis, and accumulation of surplus cars in the hands of dealers or in warehouses will not be permitted. The largest decline in car production last month was in the Ford plant, where the total was approximately 90,000. The company expects to produce an equal number of cars in October, but if there is a sharp falling off in orders, of which there is no indication at present, this output will be curtailed.

The indications are that while the actual number of cars sold in October will be smaller than in September, the aggregate value will be higher because with the slackening of demand for touring cars, there will be an increased sale of enclosed models, which are all in a higher price class. Almost without exception, body builders are running to capacity on enclosed models and dealers report an exceptionally strong demand for cars of this class.

One of the most gratifying features of the situation today in the automobile field is the increased call for motor trucks. Sales of light delivery trucks have been better for several weeks, and they now are extending into the heavy duty field. This is an unmistakable indication that general business is improving and that the larger volume of freight makes necessary an extension of transportation facilities.

## RUBBER RECEIVERSHIP ENDS

Akron, O., Oct. 8—Elihu Harpham has been discharged as receiver of the Interlocking Cord Tire Co. of Akron and Mogadore, following an agreement reached by the new management of the company with creditors, whereby all creditors' claims are to be satisfied. The basis of settlement will include a 15 per cent cash payment of all claims within 45 days, the balance to be secured by one and two-year notes. New officials under the reorganization claim they will have assets sufficient to cover the firm's entire liabilities of \$120,000. They also announce plans are being made for resumption of production some time next month.



## BUSINESS NOTES

**K. S. Conrad Co.**, Greenville, S. C., has been chartered to manufacture and deal in motor vehicles. Capital stock is \$60,000. Officers are: K. S. Conrad, president, W. A. Harris, vice-president, V. O. Garrison, secretary.

**Tilghman Motor Co.**, Wilson, N. C., has gone into the hands of a receiver. The approximate assets are \$86,000; liabilities, \$135,000. Hugh S. Sheppard was appointed temporary receiver.

**Manager Robert W. Martland**, of the Oakland, Calif., Automobile Show announces that the dates for the fourth annual show have been set. It will be held in the Oakland Municipal Auditorium Jan. 16 to 22, inclusive.

**Durant Motors Co.** of California, distributors of Durant cars for the Pacific coast, has filed application with the state corporation commissioner of Oregon to operate in the state. The capital stock is given as \$3,000,000. The Oregon representative of the Durant cars has not yet been named.

**American Motor Parts Co.**, Rock Island, Ill., is moving its unit in the R. & V. Motors plant to the new factory location in the Ideal Milling Co. plant, with no appreciable let-up in production schedules. The R. & V. Motors disposed of a large section of its plant to the Troy Laundry Machine Co., which is now taking possession.

**Kil-Nock Co., Inc.**, Davenport, Ia., with \$25,000 capital, has filed articles of incorporation to conduct wholesale and retail manufacture of automobile accessories, vehicles and electrical and mechanical apparatus. John F. Rose is president, Wayne Bashaw, vice-president, and A. G. Bush, secretary.

**Interstate Automobile Federation**, organized at Freeport, Ill., to provide repair and relief service for motor vehicles, has been moved to Rockford, Ill. The members of the company are C. C. Smith, president, L. A. Jayne, O. P. Hand, J. T. Gerber and E. O. Faulkner, all of Rockford, with the exception of Jayne, who is from Freeport.

**3-O Auto Supplies Stores, Inc.**, Philadelphia, has had a petition in involuntary bankruptcy filed against it.

**George A. Archer and William C. Willard**, receivers for the Allen Motor Co., of Columbus, have applied to the U. S. court for permission to sell the assets at public auction. The assets consist of the plant, machinery and stocks. Claims against the company are in the neighborhood of \$2,000,000, and assets are estimated at something less than that amount.

**Chevrolet Brothers Mfg. Co.**, organized by Arthur and Louis Chevrolet, will move into its own building within the next week or 10 days. The company will manufacture Frontenac cylinder heads and also will do machine repair work.

**St. Louis Pump & Equipment Co.**, St. Louis, has purchased the building and ground of the Standard Adding Machine Co., which has been absorbed by the Century Electric Co.

**Automotive Corp.**, Toledo, manufacturer of tractors, which is about to place upon the market a small light automobile, has, by showing that it had valid dealer contracts for \$2,500,000 worth of tractors, caused to be dismissed a suit, brought by a stockholder in Federal court, asking for a receiver.

**Thomas Musk**, Fulton, Ill., for many years a dealer in motor vehicle accessories, has filed a petition in bankruptcy. His schedule shows liabilities of \$13,645, and assets of \$11,096.

**People's Battery & Electric Service Co.** has been organized at Springfield, Ill., by Avery M. Weston and Martin H. Smith.

**Frank & Weinberger**, New Orleans, composed of Theo. Frank and Frank Weinberger, local agents for Premier and Velie, have filed a voluntary petition in bankruptcy. The petition lists liabilities at \$426,846, with assets of \$144,625.

**Monroe Motor Car Co.** of Buffalo has increased its capital stock from \$60,000 to \$200,000.

**Heil Co.**, Milwaukee, fourth annual basket picnic given for employees at Army Lake recently, drew a 50 per cent larger attendance than during the years following the war when the force was much larger than now.

## Secrecy Surrounds Members of Jackson Motors Merger

**NEW YORK** Oct. 7—Creditors of the Jackson Motors Corp. agreed at a meeting in Jackson last week to accept the proposal that the Jackson company be included in a proposed \$50,000,000 automotive merger. While they accepted the plan, the creditors were left completely in the dark as to the companies with which Jackson will be associated. They simply were informed that 14 corporations would be included in the merger.

The promoters of the consolidation are surrounding their negotiations with secrecy until the plan is presented to the stockholders of the companies whose directors have agreed to the plan.

### LOCOMOBILE PRICES DOWN

**Bridgeport, Conn.**, Oct. 8—The Locomobile Co. announces price reductions, effective Oct. 2, as follows:

Model	Old Price	New Price
4-pass. touring	\$8,600	\$7,600
7-pass. touring	8,600	7,600
Limousine	10,000	9,150
Sedan	11,700	11,000
Cabriolet	12,000	10,700
Coupe	11,400	10,500
Sport type (D. C.)	10,700	9,500
Landulet	10,000	9,150

### NATIONAL RAISES PRICES

**Indianapolis**, Oct. 10—Effective Oct. 1, the National Motor Car & Vehicle Corp. has increased the price on two of its models. The new prices are:

	Old	New
7-passenger sedan	\$3,990	\$4,240
4-passenger coupe	3,990	4,140

### MAIBOHM LOWERS PRICE

**Sandusky, O.**, Oct. 7—The Maibohm Motors Co. has made a second reduction in the price of the Maibohm cars. The new prices compared to the old are as follows:

	Old	New
Phaeton, 5-passenger	\$1575	\$1395
Roadster	1575	1395
Sport roadster	1675	1395
Sport 4-passenger with disk or wire wheels	1850	1595
Coupe	2395	2295
Sedan	2395	2295

### OLD HICKORY PRICES LOWER

**Atlanta**, Oct. 8—A 50 per cent reduction has been announced on all models of White Hickory motor trucks, manufactured in Atlanta by the White Hickory Wagon Mfg. Co. Following is the new scale of prices:

	Old	New
Model E, 1 ton	\$2,450	\$1,225
Model K, 1½ ton	2,750	1,375
Model K, 2½ ton (150 in. wheelbase)	3,350	1,675
Model K, 2½ ton (168 in. wheelbase)	3,450	1,725

### STANDISH PETITION DENIED

**Toledo**, Oct. 7—At a hearing in Denver, Sept. 19, 1921, before the Circuit Court of Appeals, the Myles-Standish Co. sought leave to ask the District Court for a modification of the injunction for unfair competition that was granted to the Champion Spark Plug Co. in the U. S. District Court at Omaha, Dec. 3, 1920. The court denied the petition of the Myles-Standish Co., leaving in full form and effect the injunction entered by the District Court.

## Vehicle Shipments During September Decrease 4%

**Totals for Same Month 1921 Are 85 Per Cent of 1920—Figures Compare Favorably**

**NEW YORK**, Oct. 7—Reports of September shipments of cars and trucks made to the National Automobile Chamber of Commerce by its members show that there was a decrease of four per cent from the total last month, but they totaled 85 per cent of September, 1920. In the same month last year shipments were 16½ per cent less than in August. The September shipments compare more favorably for the same month last year than those of any previous month for 1921. The shipment figures by months for this year and last follow:

	—Carloads—	
	1920	1921
January	25,057	6,485
February	25,505	9,986
March	29,326	16,287
April	17,147	20,187
May	21,977	18,608
June	22,516	20,269
July	23,082	19,470
August	23,386	20,350
September	20,804	20,150
	—Driveaways—	
	1920	1921
January	29,283	3,185
February	43,719	7,507
March	57,273	9,939
April	64,634	14,197
May	74,286	15,193
June	60,746	18,834
July	52,342	15,320
August	34,060	14,290
September	24,431	13,550
	—Boat—	
	1920	1921
January	.....	93
February	.....	99
March	.....	75
April	.....	1,619
May	.....	2,381
June	8,350	3,947
July	8,702	3,725
August	7,095	3,565
September	5,469	3,580

### BUILD FACTORY FOR EX-SOLDIERS

**Monticello, Ia.**, Oct. 9—Employment of 100 ex-service men of this community is guaranteed by organization of the Monticello Tire & Rubber Co., a local company organized to cope with the unemployment situation among the veterans of the World War. No factory in the community is large enough to place these men; hence business men united in this new project.

**J. S. Kelly**, Davenport, proprietor of the Hawkeye Sales Co., has been made president and general manager.

### DUNLOP'S PLANT OPENS JAN. 1

**Buffalo**, Oct. 8—The Dunlop tire plant here will go into production about Jan. 1, according to information from Perry D. Saylor, general manager of the Dunlop company, who is now in England making arrangements for the opening of the plant.

The company will start tire production with an initial force of between 2500 and 3000 men. The firm's new \$25,000,000 plant has not yet been operated on a production basis, although experimental tires have been made for some time.

# The Readers' Clearing House

## Questions & Answers

CONDUCTED BY WILLIAM H. HUNT

### ELIMINATING HARSHNESS IN THE CLUTCH ENGAGEMENT

Q—We are working on a 1915-C Buick that has had a new clutch leather put on. It has been run about two months and the clutch now is as rough as ever. Putting on neatsfoot oil helps for a day or two.

2—Advise whether it is possible to reface this clutch with Raybestos facing, and also advise if this will stop the clutch from grabbing.

3—If it is refaced with this material, will it be necessary to run it in oil, like the Maxwell clutch?—Drury Garage, East St. Louis, Ill.

1—We suspect that when the new lining was installed the cushioning springs under it were left out. Reference to Fig. 1 will make the meaning of this clear. The parts in question are marked "clutch spring and plunger." The term clutch spring must not be confused with the large main spring. As you are probably aware, the springs and plungers have the function of so raising the clutch leather over them that, as the clutch is let in, these high spots engage first and get the car under way gradually. As the clutch is still further engaged, the plungers are pressed down until the leather is in contact with the flywheel at all points. If the plungers have been left out or if the springs have lost their tension, instead of the clutch engaging at the high spots first, it will take hold over its whole surface as soon as it touches the flywheel, which action results in the severe "grabbing" com-

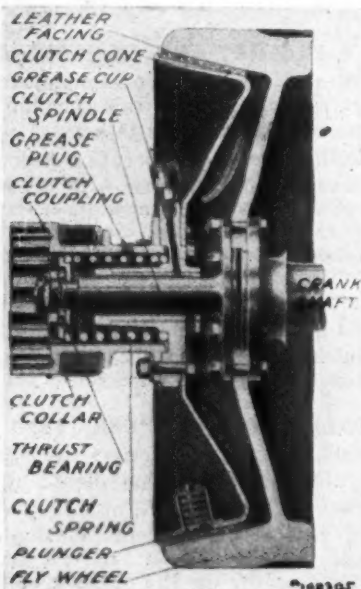


Fig. 1—Cross-section of leather-faced cone clutch used in Buick 1915-C models. The plungers under the leather are designed to assure smooth, easy engagement

### The Readers' Clearing House

*THIS department is conducted to assist Dealers, Service Stations, Garagemen and their Mechanics in the solution of their repair and service problems.*

*In addressing this department, readers are requested to give the firm name and address. Also state whether a permanent file of MOTOR AGE is kept, for many times inquiries of an identical nature have been asked by someone else and these are answered by reference to previous issues. MOTOR AGE reserves the right to answer the query by personal letter or through these columns.*

*Emergency inquiries will be replied to by letter or telegram.*

*Addresses of business firms will not be published in this department, but will be supplied by letter.*

plained of. Examine the plungers to see whether they are working freely, and, if necessary, install new springs.

2—We should strongly advise against attempting to reface the clutch with Raybestos or any other of the friction materials, for the reason that it was designed to operate satisfactorily with a leather lining, and, although we do not positively know such to be the case, it is quite likely that the angle is not correct for Raybestos.

3—See above.

### GAS AND STEAM ENGINE HORSE-POWER

Q—How is steam engine horsepower calculated?

2—Why does not a gas engine develop as much or even greater horsepower at maximum speed as at near-maximum speed? The power curves shown in Motor AGE of various engines show the horsepower to be less at maximum speed than at near-maximum speed.—Alvin Steinberg, Tilleda, Wis.

1—The formula for calculating engine horsepower is as follows:

$$I-H-P = \frac{P \times L \times A \times N}{33,000}$$

P is the mean effective pressure in pounds per square inch throughout the stroke. It is dependent upon the initial pressure. L is the length of piston travel in feet. A is the area of the piston and is arrived at by squaring the bore and multiplying by .7854. N is the number of single strokes per minute. It is multiplied by 2 for a double-acting engine. The figure 33,000 is the arbitrary value representing the number of foot-pounds per minute equaling one horsepower.

2—It takes power to move reciprocating parts. Every time a piston or valve comes to rest and is started in the opposite direction, power is absorbed. For this reason, beyond a certain critical speed so much power is required to move the reciprocating parts that the available power of the engine begins to fall off. Carrying this reasoning far enough, an engine may be imagined that requires all of its power to move its own parts, leaving none for exterior load.

ing parts. Every time a piston or valve comes to rest and is started in the opposite direction, power is absorbed. For this reason, beyond a certain critical speed so much power is required to move the reciprocating parts that the available power of the engine begins to fall off. Carrying this reasoning far enough, an engine may be imagined that requires all of its power to move its own parts, leaving none for exterior load.

### CHANGING MAGNETO FROM SIX TO FOUR-CYLINDER TYPE

Q—Can a Bosch B6-ED2 magneto be changed to a four-cylinder type, and, if so, what parts will be needed and where can they be procured?

2—Could an 83 Overland engine be fitted with sleeves so as to reduce the bore from 4 1/4 in. to 3 3/4? Would this reduce the power, and about how much?

3—Where could the sleeves be procured?

4—Which would be better, to install the sleeves or have the engine rebored? We wish to overcome the bad piston slaps in this engine.—Lester H. Beaman, Lynn Grove, Ky.

1—Yes. It will be necessary to procure a B4 distributor rotor and gear complete, and also a B4 armature pinion. Apply to the American Bosch Magneto Corp., 3737 Michigan avenue, Chicago, giving the above code figures and the magneto serial number.

2—It could be, but the results cannot be predicted with certainty. We therefore strongly advise against making the attempt. The power would be reduced about 25 per cent.

3—They would have to be made to order. Any first-class machine shop should be able to do the work.

4—By all means have the engine re-ground and new pistons fitted. Making them slightly longer than the old ones will do much to eliminate the slapping.

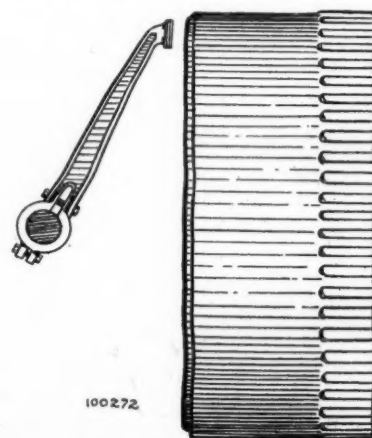


Fig. 2—Suggested method of applying a clutch brake to 1915 Buick, model C 25



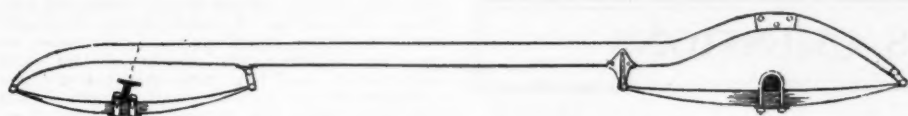


Fig. 3—Side view of frame to be used with Dodge Brothers car converted into racing car

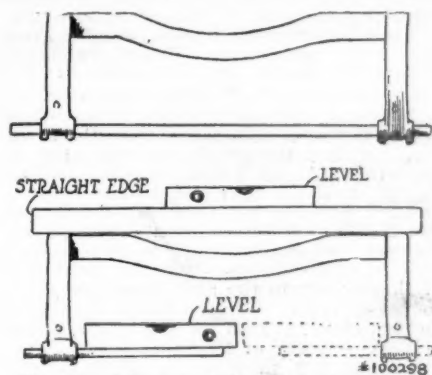


Fig. 4—After straightening, the frame can be lined up with rods and spirit levels

### SPEED POSSIBILITY OF SINGLE AND DOUBLE CARBURETER

Q—We have a Rajo equipped Ford and would like to know which would give the most speed, two Holley one-inch carbureters or one 1½-in. Rayfield carburetor?

2—Can we connect an old Bosch magneto DU-4, off of a Metz car, about a 1910 model, to the Ford?

3—Where can we purchase the necessary attachments?—T. D. Magruder, Sturgeon, Mo.

1—Without going on record as comparing the speed possibilities of the two makes of carbureters, we believe you will get better acceleration and possibly greater speed by installing the two independent units of either make.

2—There is no reason why the installation cannot be made.

3—The necessary attachments may be procured from the manufacturer or any Bosch service station or branch establishment. The names of two of these in your locality are being forwarded by mail. When ordering the parts, be sure to give as explicit data as possible. Such information as the year model of the machine, and whether or not it is equipped with a generator, will save much time and annoying correspondence.

### EQUIPPING OLD CAR WITH CLUTCH BRAKE

Q—Publish a wiring diagram of the C25 1915 Buick.

2—We are thinking of installing an Atwater-Kent ignition system on this car. Would it be advisable, could it be done, and would it be an improvement over the Delco?

3—This car has a cone clutch and it is a trifle difficult to shift gears at times. A small clutch brake would be a help, we believe. Have you any suggestions as to how it should be attached?

4—Would you advise retaining the Marvel carburetor or discarding it for another of another make?—O. W. Johnson, Champaign, Ill.

1—See Fig. 5.

2—We would advise against this change for the reason that it will entail an expense out of proportion to the value of the car.

3—See Fig. 2. A small forging, ending in a fiber block to press against the

rim of the clutch, can be mounted on the clutch shifter cross shaft, as shown. Any blacksmith or machine shop should be able to make the part.

4—The Marvel carburetor has always given good results on this car, and there is no reason why the present one should not, unless the moving parts are badly worn. In this event, we would advise that another Marvel be installed.

### CONVERTING DODGE INTO A FAST SPEEDSTER

Q—We wish to convert a 1915 model Dodge Brothers touring car, in good running order, into a two-passenger speedster. What changes would you suggest to increase the speed, other than changing the gear ratio?

2—Would it be advisable to sling the springs under the axle to gain a low center of gravity?

3—Can you publish the address of the Continental Motor Co.?—L. S. Beardslee, Smith Center, Kan.

We assume that your aim is not to produce a racing car, but simply a speedster of a higher speed capacity than the stock car. Minor changes, which will not necessitate a great outlay, will increase the speed of this car as much as can be reasonably desired. Of these, the greatest benefit will be realized by enlarging the valves. One rebuilder increased the speed of his car materially by installing the size of valve used in the Hudson Super Six. In fact, he used the Hudson valve. However, any valves of the same size would serve as well. A racing type carburetor would also increase the speed.

2—While it would be well to undersling the springs, the cost of so mounting the rear end would possibly be greater than you anticipate. It is not sufficient merely to mount the springs

under the axle. The frame must be altered, as shown by the illustration in Fig. 3. The riveting on of the frame extension is a very expert job, and, unless it is perfectly done, the frame will be so badly out of alignment that the car will not handle well. The front spring horn and the new ones in the rear are lined up by means of a spirit level, as shown in the illustration, Fig. 4.

3—Continental Motors Corp., Detroit, Mich.

### MISCELLANEOUS INQUIRIES ON HUDSON 33

Q—Give us instructions for installing an Eismann generator on a Hudson model 33 car.

2—Can smaller wheels be used successfully on this car, and, if so, would it cause any excessive strain on the engine due to higher speed?

3—Also give directions for taking out end play in the crankshaft.—H. J. Morris, La Salle, Ill.

1—The Eismann Magneto Corp. is supplying a combination generator and magneto made to F. A. E. specifications which will fit on the present magneto mounting and take the place of the Bosch magneto now used. For full information on this unit we would refer you to the Eismann Magneto Corp., 1469 S. Michigan Ave., Chicago.

2—Of course, speed for speed, the engine will have to turn faster with the small wheels than it would with the large ones, unless you care to go to the expense of increasing the rear axle gear ratio. If the car speeds are held within reasonable limits there is no reason why the engine should be damaged.

3—Install new main bearings throughout.

### WHEEL MISALIGNMENT MAKES CAR SWAY

The disconcerting jump of the rear end of a car to right or left when crossing a rough place is usually caused by a misalignment of the front and rear wheels. Squaring them up with a straight edge and adjusting the steering gear for camber and gather will generally eliminate the trouble.

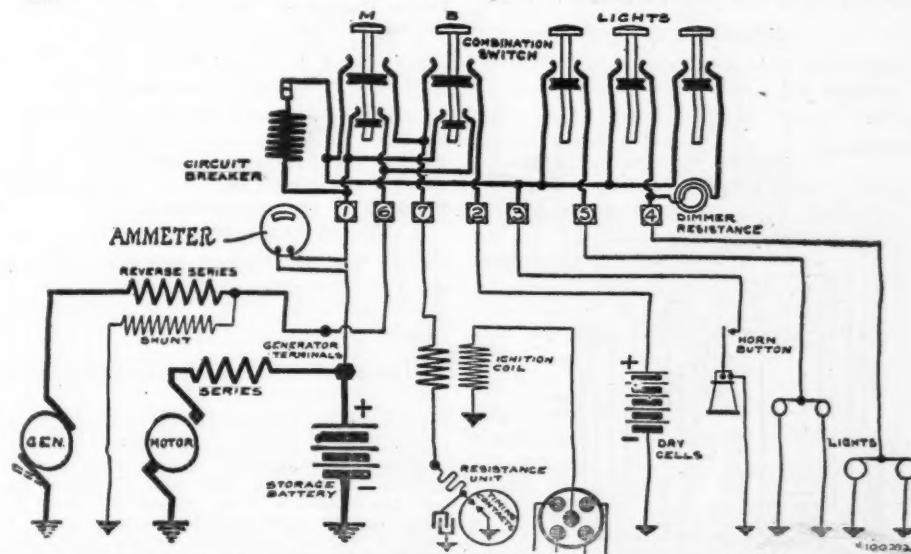


Fig. 5—Diagram of internal and external circuits of Buick, C 25-1915. Delco starter-generator model No. 56. Delco ignition coil No. 2111. Delco combination switch No. 1048

## MISCELLANEOUS QUESTIONS

### MAGNETOS NOT DEMAGNETIZED BY METAL COUPLING

Q—Having had some trouble with the fibre coupling used on a Splitdorf magneto, we had decided to put in a metal one but heard that fibre was used to keep the magnets from demagnetizing. Is this correct or not?

2—Should the spark be advanced more for burning kerosene than gasoline?—F. E. Brooks, The Central Garage, Rouleau, Sask.

1—Metal couplers of brass, bronze or steel can be used without danger of demagnetizing. The stock Micalta coupling is used to eliminate noise. These couplings have proven entirely satisfactory in thousands of installations. Failure can usually be traced to water soaking, a leak from the circulation system or other cause, which has the effect of disintegrating the material; or may be due to too tight an adjustment of the impulse starters. In the latter case, the blow is great enough to crack or shatter the material.

2—No.

### MORE TROUBLE WITH CLOGGED CIRCULATION SYSTEM

Q—Publish the best method of clearing the deposits out of a circulation system.—H. Bushnell, Chicago, Ill.

This subject has been covered quite completely in recent issues.

### TIMING OF CHEVROLET 490

Q—We wish to inquire about a Chevrolet 490, 1919 model. The timing gear on the camshaft was broken and was replaced. The crankshaft gear was not changed. Since the work has been done, the engine appears to have lost its power and seems sluggish and heats. It seems to be timed right according to the valves but does not have the power it should have, although it fires on all four cylinders regularly. What do you think the trouble could be?

2—What speed is it possible to get from a Mitchell model F 40, unchanged since it came from the factory?

3—What speed will an Essex make with the original gears and parts, as it came

from the factory? This last is a 1920 model.—R. S. Stahl, Sarver, Butler county, Pa.

1—It is more than probable that you have retimed this engine late. Following is the proper timing: Inlet valve opens 16 deg. past top dead center and closes 52 deg. past bottom dead center. Exhaust valve opens 40 deg. before bottom dead center and closes 16 deg. after top dead center. The clearance between the rocker arms and the valve stems should be .002 for both inlet and exhaust valves.

2 & 3—The speed of the Mitchell F 40 and of the 1920 Essex, as given by the manufacturers, is 45 m.p.h. for the former and about 65 m.p.h. for the latter.

### HIGHEST SPEED MADE BY STEAM CAR

Q—Is it true that the Stanley Bros. ever offered to give a steam car or a cash prize to anyone who would drive one of their cars wide-open for one minute?

2—What is the highest speed ever made by a stock car?

3—What is the highest speed ever made by a steam racing car?—H. H. Mantz, Seattle, Wash.

1—This story is on the order of that circulated a few years ago to the effect that Henry Ford would give away Ford cars on his birthday. It has no foundation in fact.

2—The Stanley Motor Carriage Co. claim a sustained speed of 55 m.p.h., and an acceleration to 70 to 75 m.p.h.

3—The highest speed attained by a steam car was that made by F. B. Merliot driving a Stanley. The record of one mile in 27 1-5 seconds stood for six years.

### LOCATION OF BRAKE ON BORG & BECK CLUTCH

Q—Where is the brake on the Borg & Beck clutch of the Liberty Six 1909 model, car No. 7K28075? This clutch does not seem to have any clutch brake, but we know that most Borg & Beck clutches have them.

2—How should this clutch be adjusted? 3—Publish a sectional view of this engine.—E. J. Kelleran, San Jose, Calif.

1—The clutch in question has a brake, as have all Borg & Beck clutches. In Fig. 7, the brake is located just to the rear of the clutch throwout collar. It is marked by the dimension 1/2 in.

2—The removal and adjustment of this clutch was completely described in the issue of September 1.

3—This view is not available at this time.

### THINKS ENGINE HAS COMPRESSION KNOCK

Q—I have an Overland 80 in my garage which has a knock very much like one caused from carbon. I overhauled the motor last winter, and being unable to get the shallow ring which is used in Overland 80 over another inside ring, I used a set of standard depth No-Leaks rings. The motor runs fine but has that knock. I burned out carbon four times this summer, because it acted so much like a carbon knock, but it did not entirely eliminate the knock. There was

not very much carbon in the motor at any time I burnt it. I changed to Overland shallow rings, thinking that oil might be passing between the inside of the ring and piston, and that probably the pistons slapped on the cylinder wall, but these did not eliminate the knock, although they cut down consumption considerably. It knocks when on a hard pull, whether engine is cold or warm, and has the hollow metallic sound like carbon, or piston slap. I have come to the conclusion that it is a compression knock, caused from too high compression. What thickness should the gasket under the cylinder be?

2—How am I to wire the generator on a Maxwell 1915 car, which has positive and negative wire leading from the same, through an Auto-Lite cutout, or relay, so that the battery which is a 6-12 type, having two separate 6-volt batteries in one box which are not connected together, can be charged. Both terminals from one side of the battery go to the starter switch, one terminal from the other side of the battery to the switch and the other to the ground. Also, how can we install an ammeter? This is the Simms-Huff system.—Reader of Motor Age, Corry, Pa.

1—You fail to mention whether this engine knocks on all four cylinders. From your description we suspect that the trouble is worn pistons. Lowering the compression will not help greatly. You might try an extra thick fiber gasket, say 1/8 in.

2—You cannot use an Auto-Lite cutout for the reason that the original device is a combination cutout and regulator. Fig. 6 is a clear illustration. Ward Leonard controllers have been used with entire satisfaction on these systems. They can be purchased from any automotive electrical supply house.

### WHERE TO GET BOOKS ON ELECTROPLATING

Q—We have installed a nickel plating outfit, but we have lost all diagrams and recipes and our back numbers of Motor Age were burned. Can you tell us where we can get any literature on nickel plating or can you print same in the columns of Motor Age questions?—A-1 Auto Repair Shop, Galveston, Tex.

The subject of electroplating requires more space than is available in these columns. There are several text books published which treat it quite exhaustively. Among these is the "Electroplaters' Hand Book," which may be procured from the U. P. C. Book Co., 239 W. 39th St., New York City.

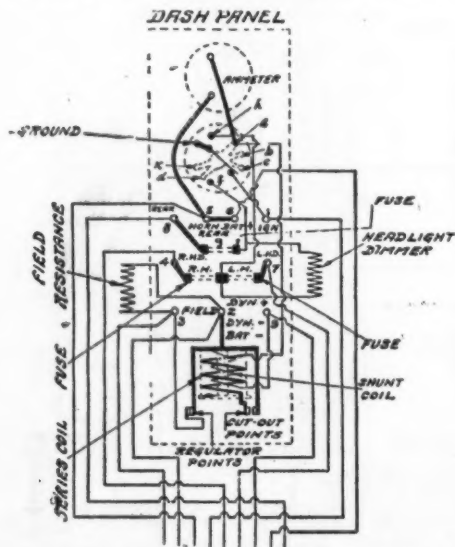


Fig. 6—Regulator and cutout used with Simms-Huff starter generator on Maxwell cars

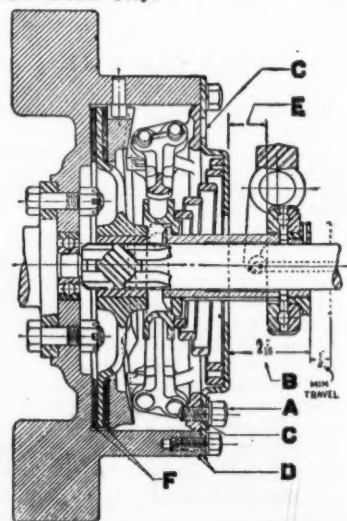


Fig. 7—Sectional view of the Borg and Beck clutch used in the Liberty Six cars



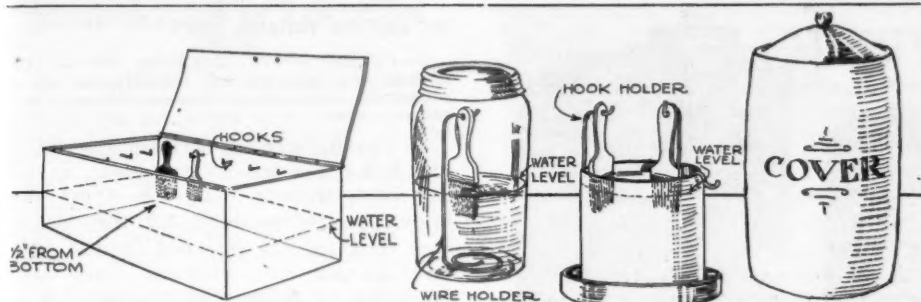


Fig. 8—This illustration shows a water type brush keeper. Water must cover the hair of brushes, and they must hang off bottom

A piece of stiff wire can be bent into shape and placed in a fruit jar to hold brushes. Suitable for storing varnish brushes, as it is air-tight

This illustrates a two compartment type of keeper. Note how you can also suspend brush in the liquid by means of a small hook placed in its side. Suitable for water or varnish

### CARE OF PAINT BRUSHES

Q—Please advise how to clean and care for brushes used in painting automobiles. We are doing some painting in connection with repair work and only paint a car every week or two and we want to know how to clean the brush and care for it when not in use.

2—Why does the paint speck? It seems specked—that is, there are specks all over the surface that look more like dead paint or sand than anything else. We have not an ideal place for painting but feel sure these specks are not dust. If you can give any light on this it will be appreciated.—United Motor Co., Conway, Ark.

1—Store the brushes in suitable brush-keepers when they are not being used. These brush keepers are usually given away by the larger varnish manufacturers, but they can also be made as shown in Fig. 8. Brushes used in priming, or applying surfacing or color coats can be kept stored in water. Those used in color varnish can be stored in a mixture of half rubbing varnish and linseed oil; those used in finishing stored in a mixture of half finishing varnish and linseed oil. A special material known as Brush-Keeping Varnish can be had from the manufacturer. In any case, the material that the brush is stored in should be well worked out of it before it is used for applying the respective coats. This working out must be done in the same kind of material that the brush is to be used in.

2—The specks that you mention can be caused by any one of four different things: dirty varnish, dirty brushes, dirty surface or dirty room. You state that it is not the fault of your work-room, and as it is improbable that it is caused by the varnish itself, the chances are that your difficulty lies in not knowing how to prepare the surfaces or brushes for use. At any rate by correcting these faults, one at a time, you can quickly solve your problem.

### GASOLINE CLEANS GUM OUT OF PISTON RINGS

Some engines will not operate well on the fuels distilled from coal tar products, as these fuels often gum the piston rings and cause an engine to show indications of having loose pistons. The condition can many times be remedied by using gasoline for a while, pulling the choker closed just as the engine is stopping. The raw gasoline drawn in

in this manner, while it has a tendency to dilute and cut the oil from the cylinder walls, also has the desirable effect of dissolving the gum in the piston rings. It is recommended that cars operated on the fuel mentioned have gasoline put into their tanks every two or three weeks.

### READER'S METHOD OF ELIMINATING OIL PUMPING

We recently had occasion to rebuild a Maxwell engine. We ground the block and fitted the pistons to .001 in. down. A popular make of step cut ring was used. After the job was assembled we had all kinds of trouble with it. The engine used one quart of oil a day and, as a result, fouled with carbon badly. The owner brought the car back and we disassembled the engine and found everything as perfect a fit as when we had assembled it. We next chamfered below the bottom ring and also just below the second ring from the top. We then drill-

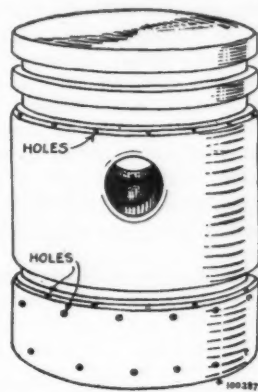


Fig. 9—How a reader machined pistons to eliminate excessive oil pumping

ed holes at an angle through the chamferes and also in the skirts of the pistons. Since reassembling, the engine has been running perfectly, using only one pint of oil in three days, and the customer is well pleased. In contradiction to this, a mechanic acquaintance of ours says he does not bore holes in the piston, as it makes them pump oil. And so it goes. The subject of piston fitting and elimination of oil pumping seems to be not well understood.—Guarantee Motor Co., Hamilton, Canada.

(This reader's method of machining the pistons is shown in Fig. 9. It is true that the subject of piston fitting and the elimination of oil pumping constitute one of the mysteries of the industry. Popu-

lar makes of rings which work perfectly in one engine make bad records in others despite the expertness with which they may have been fitted. We have a theory, that under certain conditions, the rings act as valves and convert the engine into a more or less efficient pump. It seems remarkable that the pumping action should be powerful enough to raise the oil against the expansive force of the burning gases. However, whatever the cause may be, oil pumping is prevalent. We should be pleased to receive the comments of our readers on this subject.—ED.)

### DELCO STARTER-GENERATOR CHARGING AND CONSUMPTION RATES

Q—What are the merits, advantages and disadvantages of engines with their cylinder head hold down studs passing through the cylinder block and screwed into the crankcase? When the cylinder block gets hot and expands, will it not break the studs?

2—Can a Templar engine and transmission be placed into a Willys-Knight chassis with a reasonable amount of alteration?

3—What is the bore and stroke of Gaston Chevrolet's Monroe?

4—Why are not overhead camshaft valve-in-head engines made in stock passenger cars?

5—Do you know whether or not the train of gears up the front of Chevrolet's engine driving the overhead camshaft made any noticeable noise, either running idle or in the races?

6—How many amperes does a Liberty Six Delco starter draw?

7—A large Wescott six-cylinder starter?

8—How many amperes do the Delco generators for these cars make?—Chas. A. Hassler, Jr., Pratt City, Ala.

1—The principal advantages are accessibility and the elimination of the flange at the bottom of the cylinder, which has been known to break off under severe strain. We know of no disadvantages. The problem of expansion is so taken care of in the design that the stay bolts expand equally with the cylinder castings.

2—The change should be practicable. Probably some old shape forgings will be needed. Any good blacksmith should be able to make them.

3—Bore 3.125—Stroke 5.9375.

4—Overhead camshafts have been used in stock passenger cars very successfully. The present Willys Sainte Claire engine is an example.

5—Not exceptionally noisy.

6—Delco starter, Liberty engine running free, 40 amp.; turning engine at 100 r.p.m., 145 amp.; lock torque 10 ft. pound, voltage drop to 3.5 to 3.6.

7—Westcott six-cylinder cars have been Delco equipped since 1915; therefore we cannot reply to this question until we know the model of the car or the type number of the starting motor.

8—Delco generator output: See 6; 5 m.p.h., 375 r.p.m., 00 amp.; 10 m.p.h., 750 r.p.m., 6-8 amp.; 15 m.p.h., 1125 r.p.m., 12-14 amp.; 18 m.p.h., 1200 r.p.m., 13-15 amp.; 20 m.p.h., 1500 r.p.m., 15-16 amp.; 25 m.p.h., 1875 r.p.m., 13-14 amp.; 30 m.p.h., 2250 r.p.m., 10-12 amp.; 35 m.p.h., 2625 r.p.m., 10-12 amp. Regarding the Delco equipment of the Westcott Six see reply to question No. 7.

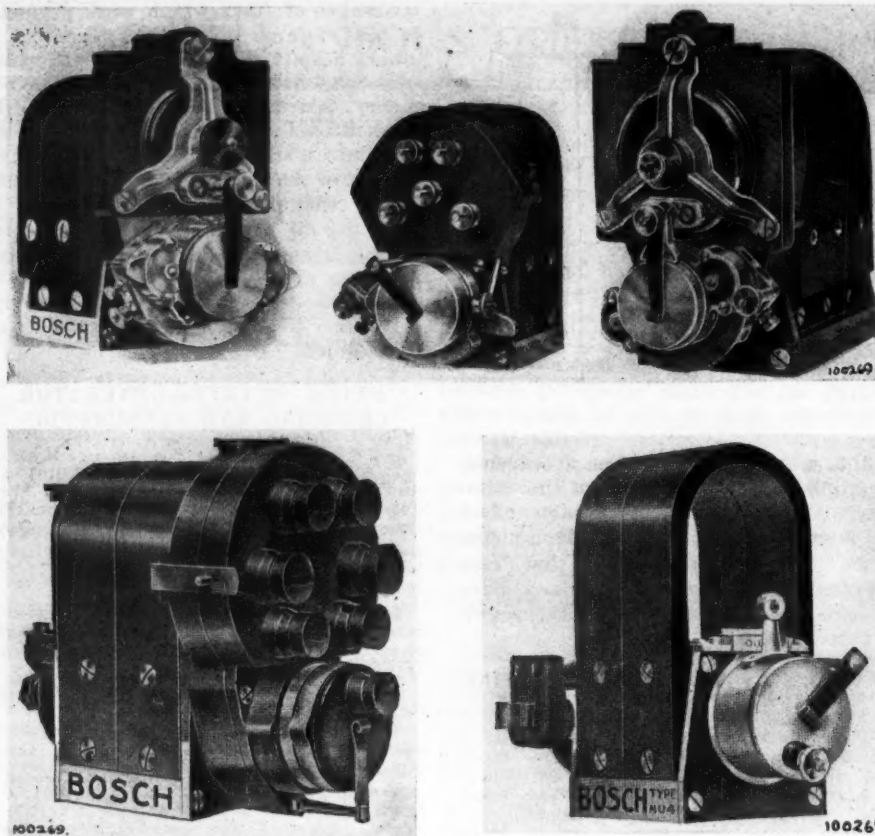


Fig. 10—Various types of Bosch magnetos. TOP, left—D. R. 4; Center—D. U. 4 Dual; Right—D. 6. BOTTOM, left—ZR 6; Right—NU 4. The figures 4 & 6 following the letters denote the number of high tension segments in the distributor. Thus the D 6 and ZR 6 shown are for six-cylinder engines. The machines designated D 4 and ZR 4 are suitable for four-cylinder engines

#### PROBABLY SHORT-CIRCUITED SERIES FIELDS

Q—We have overhauled a Dort electrical system on a 1915 or 1916 model and now find that the Apple Splitdorf A-25 starter generator will charge alright, but that it fails as a motor. The brushes smoke badly when the starting switch is closed. We tried another battery with wires direct to the starter-generator, with the same result. It doesn't have quite the power to turn the engine over. The commutator was turned and the carbon brushes sanded to a close fit. The mica was also undercut. Would not copper brushes improve this system? All wires on the commutator are well soldered in and do not seem to have been burned. Furnish complete wiring diagram of this system, showing the internal connections. —R. C. McNamara, Pierceton, Ind.

See Figs. 11 and 12. Fig. 11 is of the external wiring circuit of the whole car, while Fig. 12 shows the windings of the starter-generator. It will be seen that the full 12 volt battery current passes through the heavy series windings of the starter-generator and also through the armature by way of the four brushes. We believe it likely that the series field windings have become badly short-circuited. This would account for the fact that the starter will barely turn the motor over, although drawing current great enough to cause the brushes to smoke. It would also account for the fact that the unit performs satisfactorily as a generator.

We would suggest that you connect a high reading ammeter in series with the system and note how much current the starter generator draws. This should not be over 350 amp. with the

motor stalled, and the battery voltage should not drop below 9.4 volts. If the discharge is higher or the voltage drop lower, a heavy short-circuit in the apparatus is indicated, and it will be necessary to have the field windings replaced. Copper brushes will not be satisfactory. However, the regular type of copper graphite starting brush should perform perfectly if the rest of the system is in normal working condition.

#### DIFFERENCES IN BOSCH MAGNETOS

Q—What are the differences in the Bosch DU4, D.R.4, D4, N.U.4 and ZR4 magnetos?

2—What is the difference between the set and the variable spark?

3—Of the above magnetos which one would you suggest for installation on a model 35 Oakland 4.—Chann Koons, Fort Smith, Ark.

1—The differences between the D.U.4 and D.R.4 and the D4 are slight, as all are Dual systems. The Z.R. types are known as independent, for the reason that they are not designed for use with an induction coil. However, they may be wired to operate satisfactorily with Bosch Duplex starting coils. See Fig. 10.

The N.U.4 differs from all the other types in the construction of the distributor which is inbuilt into the drive end of the armature and runs at armature speed. The contact pieces are in the form of two half rings, each of them independently insulated by a two part insulator mounted directly on the end of the armature shaft, as above mentioned. Another peculiarity of this magneto is that it fires two plugs at once. Plugs No. 1 and 4 fire together as do plugs No. 2 and 3. However, as one of the simultaneously firing plugs always fires during the exhaust stroke, the spark may be said to be wasted, although this is not exactly the case, as the double gap has an intensifying effect.

2—The set and the variable spark are, as their names imply, set to cause the spark to occur at one point in the piston travel, or designed so that the spark may be advanced and retarded at will.

3—We believe that any of the magnetos of the D.U. type, whether independent or dual, will give excellent results on this car.

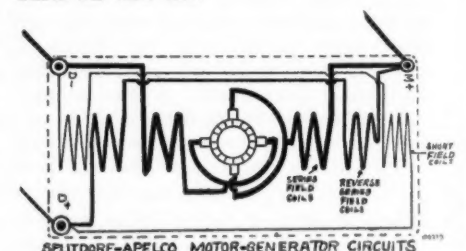


Fig. 12—Field windings and internal circuits of Splitdorf-Apelco 6-12 volt starter-generator used on Dort, models 4 and 5, 1915 cars.

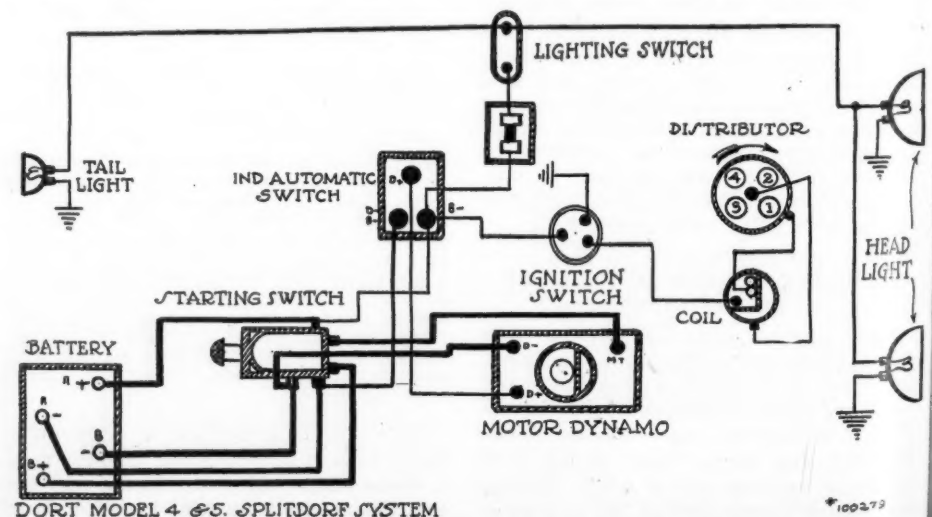


Fig. 11—External circuits of the electrical system used on the Dort cars, models 4 and 5, 1915. Splitdorf-Apelco, 6-12 volt motor-generator, Connecticut ignition



## BEARINGS USED IN NEW BUICK FOUR

Q—What kind of bearings are used in the new Buick four engine, transmission, differential and front and rear wheels?—Geo. I. Crocker, Weidner Motor Co., Ottawa, Kan.

Engine—Plain Die Cast Babbitt. Transmission—New Departure. Differential—Hyatt Roller. Front Wheels—New Departure. Rear Wheels—Hyatt Roller.

## WHERE TO PROCURE VARIOUS WIRING DIAGRAMS

Q—Advise where we can procure a diagram of a generator and motor and how a car is wired up, and also where we can procure wiring diagram books and their cost.—Joseph Madzia, Kansas City, Mo.

If you want the wiring of cars, generators, starting motors and ignition systems, in general, you can secure them by copying those found in nearly every issue of MOTOR AGE. If, on the other hand, you wish wiring diagram books showing the diagrams of all makes and models of cars and apparatus you may procure them from the U. P. C. Book Co., 239 W. 39th st., New York City.

## REPAIRING SCORED CYLINDERS

Q—Advise us of the latest practical methods of repairing scored cylinder blocks.—V. E. Willard, Parks, Tex.

When the scores are not too deep, the best method is to regrind the blocks and install new pistons. On very deep scores, such as those caused by loose wrist pins, a very successful practice is to fill them with one of several silver nickel alloys. These processes are all secret and patented and are leased by their controllers. The names of the various concerns are being forwarded to you by mail.

## MISCELLANEOUS INFORMATION ON NEW BUICK FOUR

Q—What are the first, second, high and reverse gear ratios of the new Buick four?

2—What horsepower will this engine develop?

3—Do you think it is a good car for mountain use?

4—Will it stand up as well as the Buick Six?

5—Does a long stroke give a car more power or speed.—A. J. T., Nashville, Tenn.

1—Low 13.5—1. Intermediate 7.88—1. High 4.66—1. Reverse 17.4—1.

2—It shows a dynamometer test of between 35 and 40 h.p.

3—Yes.

4—It should.

5—As a gas engine's power is largely dependent upon the piston speed and as this is dependent upon length of stroke, bore for bore, a long stroke motor will develop more power than one of short stroke. Short stroke motors are usually of higher speed.

## TOO MUCH OIL UPSETS MIXTURE

It is not generally understood that lubricating oil has a certain fuel value and that if too much is used in the crankcase it will come past the pistons and give the effect of too rich a mixture. This is true even though the engine does not smoke, as might be expected.

## MYSTERY TALES

**A**FTER a complete overhauling, a four-cylinder engine refused to fire on No. 1 and 2 cylinders except when these were primed through the pet cocks. As soon as the priming was burned out, the cylinders "ceased firing." There were no leaks around valve caps or stems and, as the inlet ports were of an odd size they were fitted with brand new gaskets cut from the best quality asbestos wire mesh packing. A test with oil showed them to be air-tight. The mechanic, after three hours' frantic search, located the trouble. What do you suppose it was?

There are thousands of these inexplicable mysteries (which, by the way, are usually very easily explained) developing daily, and it is the purpose of the "Mystery Tales" column to draw them out. If you are hiding a dark secret which is slowly but surely souring your disposition, sapping your vitality and ruining your life, drag the pesky thing out into the sunlight and let everybody take a look at it. Perhaps somebody in the crowd has a club up his sleeve in the form of a correct, or at least a plausible explanation, which will lay the thing low and save your sacred reputation. Or, perhaps you have the weapon which may preserve the sanity of some other sufferer. Now, altogether! Send in your mysteries and solutions!

### MYSTERY TALE

#### What Is Wrong With This Ignition System?

In the Sept. 8 issue of MOTOR AGE, Harry Grinnell's "Ignition Mystery" came to my notice. As I have experienced the same difficulty, I am advising a remedy. First, the spark should not be expected to jump a greater gap than 3/16 to 1/4 in. at low speeds, when the terminal is held away from contact. The breaker points should have the regular setting—that is, .006 to .008 in. Extreme care should be used in making this adjustment as well as in timing the ignition. The timer points must be just ready to break as the piston has traveled .044 in. downward on the firing stroke. Then make very certain that the carbureter is correctly adjusted (including float level, low speed pin, choker control and main adjustment), and that the spark plug gaps are .030 in. separated.

See that there are no air leaks in the manifold. The trouble should then be ended. I found that a faulty carbureter adjustment or an air leak between the intake manifold and the block caused the engine to "lope" or load up at idle speeds, causing the timer cam to turn quickly past three points and so slowly past the fourth that a sluggish break resulted, with a consequent weak spark, or none at all. Excessive backlash in the timing or distributor gears sometimes aggravates this trouble.—Florello H. Clark, Syracuse Motor Car Co., Syracuse, N. Y.

### MYSTERY TALE

#### Another Explanation of Harry Grinnell's Ignition Mystery

Your "Mystery Tale" on page 34 of the September 8 issue in reference to the Atwater-Kent ignition system on a 1921 Maxwell is an old story. We have experienced this same trouble for the past two months and have been almost at our wit's end to discover the cause. The engine showed this same irregularity in firing and we finally discovered the trouble, and believe that Mr. Grinnell will find that his trouble is identical with ours.

We removed the distributor cap connecting the spark wire from the coil to the spring on top of the distributor block. Then, by cranking the engine, we discovered that the spark would run

down the outside of the distributor block and spark against the vertical shaft, even though the spark plug wire was brought in close contact with the brush block at the proper point. Cleaning the distributor will remedy the trouble for a time, but not permanently. We found it necessary to use a new distributor, and since then there has been no trouble. We believe that if the lifter springs be lightened up so as to throw less spark, that all the spark will reach the plug and not ground to the vertical shaft."—W. H. Parker, Minneapolis, Minn.

(With the plausible solutions that have been sent in on this mystery, it should be no longer mysterious—Ed.)

### MYSTERY TALE

#### Steering Gear Moves Throttle Control

In MOTOR AGE for September 8, a reader asks why the steering gear of a Ford car moves the throttle control. As you suggest, looseness at the bottom anchorage of the steering column could easily cause such trouble. However, there are several other conditions that will produce the same effect. In two or three instances where we have encountered this trouble, it was caused by a crack in the seam on the under-side of the steering column tubing, which allowed the quadrants carrying the control levers to twist through a short arc—that is to say, until sufficient resistance was met with in the weakened tubing to transmit the hand power to the driving wheels. Since the difference in gear ratio between the steering wheel and the steering arm is effected by means of planetary gears in the head, a movement to one side of the hand wheel will cause the steering column housing to rotate in the opposite direction unless it is rigid and well anchored. M. Bumpus, Selma, Calif.

### MYSTERY TALE

#### Six-Cylinder Engine Knocks Out Bearings

In response to the query appearing under this head in the September 8 issue of MOTOR AGE, an attentive reader submits the following solution. "Mr. Frank Den Beste of Corsica, S. D., will probably find his trouble in too close a fitting of the new pistons. They expand enough to cause the rods to be jerked loose. His slow driving only kept them from freezing. I have had similar experiences myself."—R. C. McNamara, Pierceton, Ind.

# The Accessory Show Case

## New Fitments for the Car

### BIG T TIMER FOR FORDS AND FORDSONS

The Big T timer for Fords and Fordsons has a heavy pressed steel shell. A thick condensite disk with bronze contacts moulded in place is bolted to the shell, forming a single unit of shell, wire, conduit and terminals ready for installation. It is claimed the deflector prevents any oil from working into the timer from the camshaft bearing at the rear, and the flexible metal conduit and rubber ferrule exclude water, oil and dirt from the front. A compression spring lightly holds the special alloy brush in contact with the disk. The Fordtime Products Co., Warren, Pa.

### JOHNSTON PISTON AND RINGS

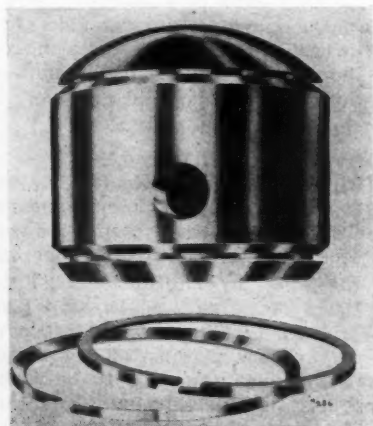
This piston is shorter in the skirt than the conventional type of piston. The theory of its construction is that the ring is forced down on its tapered seat by the force of the explosion. Only two rings are used, one at extreme top and one at the bottom. The piston head is convex. Johnston Piston Ring Co., 1216 E. Madison st., Seattle, Wash.

### D. & M. GEAR-SHIFT LOCK

This lock is designed for attachment to the gear-shift lever and locks the lever in neutral position automatically. The device is equipped with a four-pin tumbler locking cylinder and has about 200 possible key changes. Price \$12.50. D. & M. Auto Lock Co., 4755 N. Western ave., Chicago.

### MANEX HEATER FOR FORDS

This is an enclosure for the Ford exhaust manifold, carrying the heat to a hole in the dash. Heat may be shut off from the car body by means of a shutter on the dash. The heater is detached from the exhaust manifold in warm weather. Price \$3. Miller-West Co., Dayton, O.



Johnston piston and rings



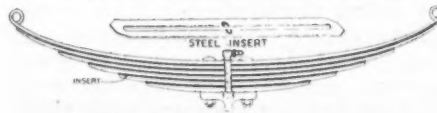
Steinbrenner two-jet carburetor



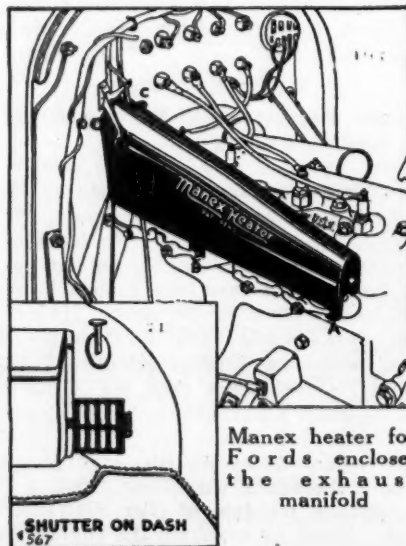
D. & M. gear-shift lock



Neverout electrical intake heater



Center-Fed spring insert insures lubrication



Manex heater for Fords encloses the exhaust manifold

### STEINBRENNER CARBURETER

The Steinbrenner is designed on the two-jet principle. For starting, the throttle valve is opened slightly and the air passes the high-speed jet. When the throttle is opened, the low-speed jet is uncovered and comes into operation. As the carbureter operates on gas control while the two jets are working, there is an increase of gas past the gas needle valve and the amount of gas passing out of the carbureter is broken into two fine streams. David Reid, 25 Liberty st., Buffalo, N. Y.

### CENTER-FED SPRING INSERT

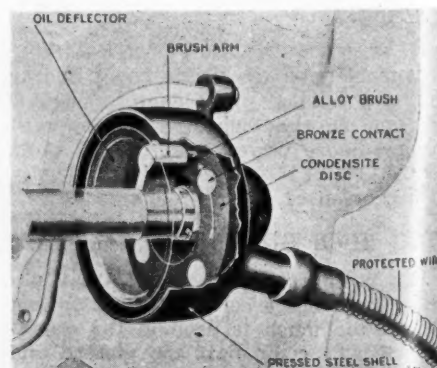
This is a spring insert with a hollow center holding oil between the leaves and insuring their constant lubrication. The inserts are made from low carbon steel .0025 in. in thickness, with a 1/4 in. slot cut in the center, running the length of each leaf to within one inch of the end. Center-Fed Spring Insert Sales Co., Coal Exchange Bldg., Wilkes-Barre, Pa.

### NEVEROUT INTAKE HEATER

The intake heater is an electrical device designed to be placed around the intake manifold, close to the carbureter. Current passing through this device generates heat which is absorbed by the manifold, warming the mixture and assisting combustion. Two insulated wires extend from the ends of the heater to the plug, which can be inserted in a dash socket. Rose Mfg. Co., Philadelphia.

### BATTERY AID

Battery Aid is a preparation which prevents leakage of electricity at battery terminals by electrolysis. It is an insulator which prevents short-circuits between battery terminals caused by accidentally spilling acid over the surface of the battery. It is also a deoxidizer, preventing corrosion. Price 25 cents. Aid Chemical Co., 4623 Lisbon ave., Milwaukee, Wis.



Big T timer for Fords and Fordsons



# Service Equipment

## Time Savers for the Shop

### LARSON ADJUSTABLE REAMER

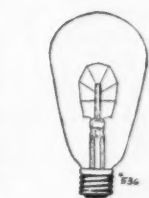
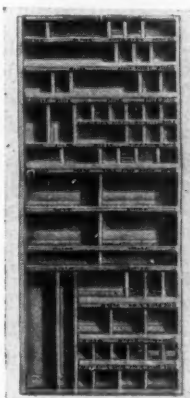
A tool like this is handy for reaming piston bushings. It reams bushings, at the same time giving accurate alignment. To operate, insert the reamer in the piston with the cutter blade protruding from both bushings, turn the adjusting nut back, permitting the spring in the other end of the reamer to feed the cutter to the work. One turn of the nut enlarges the reamer .001 in. One double-edge cutter blade cuts in either right or left-hand direction. Standard Tool & Supply Co., 651 S. Polk ave., Mason City, Ia.



Tipton piston ring tool

### LYON PARTS STORAGE CONTROL

The Lyon parts storage equipment is made of steel and has been especially designed to handle the standard stock of Ford parts. A unit is also made to store parts of the Fordson tractor. Sections may be obtained to handle parts of unusual size, such as radiators, running boards, fenders, etc. The compartments, when shipped, are of the proper size to meet the Ford requirements, but the shelving may be rearranged to handle additional parts. Lyon Metallic Mfg. Co., Aurora, Ill.

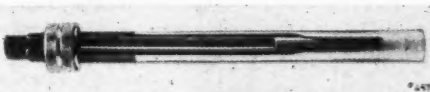


G-G lamp, mounted on concentrated coiled filament

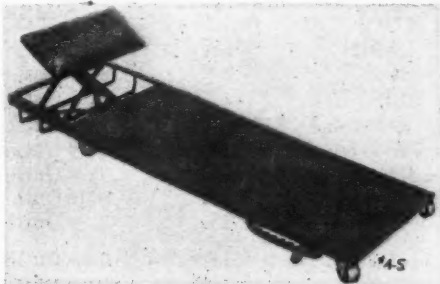
Lyon parts storage equipment

### TIPTON PISTON RING TOOL

The Tipton piston ring tool can be used to remove or put on any one joint piston ring. The claws are inserted at the cut and the long arms squeezed. This expands the ring until it slips over the piston, either out of or into the groove. Its second use is that of removing carbon from the piston grooves by virtue of the saw tooth edges being turned around the piston. Price, \$2. Tipton Mfg. Co., Tipton, Ia.



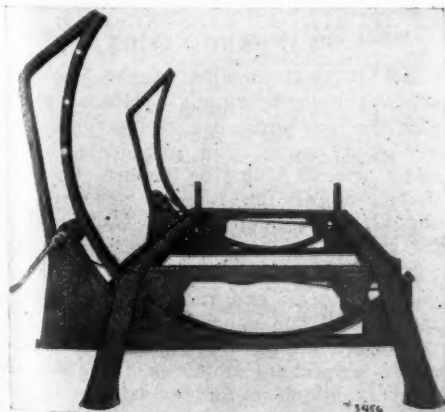
Larson adjustable reamer



Knowles creeper has adjustable head rest

### THE G-G LAMP

This is a special lamp for the garage and machinshop, for use where vibration is likely to break the filaments in an ordinary lamp. The G-G is mounted with a concentrated coiled filament and the bulb is tipless. Prices \$45 and \$50 per case of one hundred lamps. The Gill-Grindley Co., Urbana, Ind.



Topsy-turvy repair rack



Double-jet nozzle for cleaning with air and kerosene

### TOPSY-TURVY REPAIR RACK

The rack consists of two stationary cradles, not bolted to the floor, and a movable car carried on four wheels mounted on roller bearings, making it possible to turn the largest car to a vertical position by turning the cranks. The rack is so designed that a car may be run onto it from either side. Dimensions: 14 ft. 4 in. long, 7 ft. 6 in. wide, 6 ft. high to top of curved rack. Weight, about 1400 lbs. Shipped in four sections. Kenosha Boiler & Structural Co., Kenosha, Wis.

### NOZZLE FOR CLEANING ENGINES WITH AIR AND KEROSENE

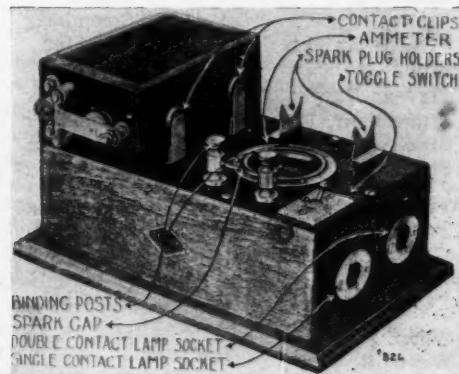
The device consists of a nozzle with a double jet, one leading to an air chuck and the other to a can of kerosene. By screwing up a thumb-nut, the air pressure is released and sucks up the kerosene, throwing it on the engine with sufficient velocity to cleanse it of dirt and grease. After the engine has been cleaned the kerosene may be shut off and the air used alone to dry it. Imperial Brass Mfg. Co., Chicago.

### B-W TESTER

This is an electrical instrument for testing Ford coil units, single and double contact lamps and spark plugs. The case is of hard wood, on which is mounted a low-reading ammeter, coil guides with contacts and spark gap. It is fitted with an indicating toggle switch. Furnished in two types: type D for direct current, type A for alternating. Price, \$11.65 and \$14.35, respectively.—B-W Electric Co., 7421 Manchester Ave., St. Louis.

### KNOWLES ADJUSTABLE CREEPER

The feature of this creeper is an adjustable head rest which can be operated while under the car by applying pressure to the lever with the foot. The creeper is long enough to accommodate the body of any man. It sets low on roller bearing casters. Price \$12.50. The Knowles Adjustable Creeper, 112 Lumber Exchange Bldg., Minneapolis, Minn.



B-W Tester for Ford coil units, lamps and spark plugs

# Carburetor Equipment on 1921 Passenger Cars

## Motor Age Maintenance Data Sheet No. 172

One of a series of weekly pages of information valuable to service men and dealers—save this page

Car and Model	Make of Carburetor	Model of Carburetor	Size of Carburetor	Type of Carburetor Connection
Liberty, 10-C	Stromberg	L-1	1	Top Outlet
Lincoln	Own	.....	1½	Top Outlet
Locomobile, 48-2	Ball & Ball	Own	.....	Top Outlet
Lorraine, 21-T	Johnson	A	1	Top Outlet
Maibohm	Tillotson	.....	1	Side Outlet
Marmon, 34	Stromberg	H-3	1½	Top Outlet
Maxwell, 25	Eagle	.....	1	Side Outlet
McFarlan, 1921.	Rayfield	.....	1¾	Top Outlet
Mercer, Series V	Ball & Ball	S-V-22	1½	Top Outlet
Merit, B	Stromberg	.....	1	Side Outlet
Meteor, R & R R	Zenith	L-6 & L-7	1½ & 1¾	Top Outlet
Metz, M-G	Stromberg	M-1	1	Side Outlet
Mitchell, Series F	Rayfield	M-R-3	1¾	Side Outlet
Monroe, Series S	Zenith	H-P-5A	1¾	Top Outlet
Moon, 6-48-21	Rayfield	L-3P	1¾	Top Outlet
Nash, 681	Marvel	Nash Special	1¾	Top Outlet
National Sextet, BB	Rayfield	G-4-P	1½	Top Outlet
Noma, 1C	Claudel	C-5	1¾	Top Outlet
Nelson, D	Zenith	Own	1	Top Outlet
Oakland, 34C	Marvel	E	1	Top Outlet
Oldsmobile, 43A	Zenith	O	1¾	Top Outlet
Overland, 4	Tillotson	.....	¾	Top Outlet
Packard, Single Six	Own	.....	1¾	Side Outlet
Packard, Twin Six	Own	.....	1¾	Top Outlet
Paige, 6-42	Stromberg	L-B1	1	Side Outlet
Paige, 6-66	Rayfield	.....	1½	Top Outlet
Pan, A	Zenith	H-P-4	1	Top Outlet
Pan American, E & F-6-55	Rayfield	M	1¾	Side Outlet
Paterson, 6-50	Stromberg	S-S-2	1¾	Top Outlet
Peerless 56, Series 7	Ball & Ball	D-V-12	1¾	Top Outlet
Piedmont, 4-30	Carter	L-O-1	1	Top Outlet
Piedmont, 6-40	Stromberg	L-B	1	Side Outlet
Pierce-Arrow	Stromberg	C-P-3	1¾	Top Outlet
Pilot, 6-50	Tillotson	.....	1¾	Side Outlet
Porter, 40	Zenith	2½	2½	Side Outlet
Premier, 6-D	Johnson	A	1¾	Side Outlet
Raleigh, A-6-60	Stromberg	L-B-2	1¾	Side Outlet
Ranger	Zenith	H-P	1	Side Outlet
Reo, T-6	Rayfield	LL-3-P	.....	Top Outlet
R & V Knight, J	Stromberg	L-B-2 & A-3842	1¾	Top Outlet
R & V Knight, R	Stromberg	A-34½-L-B-2	1½	Top Outlet
Revere, C	Stromberg	M-4	1¾	Top Outlet
Roamer, 6-54-D	Stromberg	L-B-2	1¾	Side Outlet
Rock Falls, 14,000.	Rayfield	.....	1½	Top Outlet
Saxon, 125	Stromberg	M-2	1¾	Top Outlet
Sayers Six, D-P	Stromberg	L-S-2	1¾	Top Outlet
Scripps-Booth, B-39	Marvel	E	1	Top Outlet
Seneca, L & O	Schebler	R	1	Top Outlet
Skelton, 35	Carter	.....	1	Side Outlet
Standard, J	Zenith	O-5-D	1¾	Top Outlet
Stanwood Six	Stromberg	L	.....	Side Outlet
Stearns-Knight, SK14	Schebler	R	1¾	.....
Stephens, 90	Tillotson	H-1-A	1¾	Side Outlet
Stevens-Duryea, E	Stromberg	O-3	1½	Top Outlet
Studebaker, E.J.	Stromberg	O-S	1	Side Outlet
Studebaker, E.H.	Stromberg	L-S-2	1½	Top Outlet
Stutz	Stromberg	H-3	1½	Top Outlet
Templar, 445	Stromberg	M-2	1¾	Top Outlet
Tulsa, E-1-2-3	Zenith	H-P-5	1¾	Side Outlet
Velie, 48	Stromberg	O-2	1¾	Top Outlet
Velie, 38	Stromberg	O-S-1	1	Side Outlet
Wasp, 211	Stromberg	1½	1½	Side Outlet
Westcott, C-38	Rayfield	L-3-P	1¾	Top Outlet
Westcott, C-48	Rayfield	M-3	1¾	Top Outlet
Willys Knight, 20	Tillotson	.....	1¾	.....
Winton Six, 25	Stromberg	O-3	1½	Top Outlet

### DESIRABLE PLATE-GLASS PRACTICE

IN many cases body designers have specified plate-glass window widths without regard to the commercial practice of manufacturing plate glass in even 2-in. widths. This has resulted in added cost which might easily have been avoided by a slight change in the window design. It is, of course, cheaper to use a 19¾ in. width in place of a 20¼ in. width, because the first size can be made from a 20 in. width, while the second size would require a 22 in. width, no intervening sizes being manufactured.

Because of this situation, a report has been formulated at the request of the passenger car body division of the Society of Automotive Engineers, which recommends that plate glass for automobile bodies shall be specified in even 2 in. widths, in accordance with commercial practice, if possible. It is also recommended that the thickness of plate glass should be specified in fractions of an inch, the maximum variations of thickness of any single piece of glass not to be greater than 1/32 in., in order to prevent the glass from being tapered. The report also recommends that the thickness of plate glass for windshields shall be ¼ plus 1/32 in., and the thickness of plate glass for closed body windows shall be 3/16 plus or minus 1/32 in.

### FURTHER LAMP STANDARDIZATION BY S. A. E.

The standardization of tail-lamp overall dimensions and mounting screws has been undertaken by the Society of Automotive Engineers, standards committee. At the present time there are a great variety of mountings used which could easily be reduced to one standard design, acceptable to both the lamp and the automobile manufacturer.

Standardized tail-lamps can be mounted on either the right or left-hand side of the license plate, thus eliminating the necessity of making right and left-hand lamps, which is the practice at present. The tail-lamp dimensions recommended are in accordance with present practice.

### FURTHER PRESSURE-GAGE STANDARDIZATION

At the next meeting of the S. A. E. screw thread division a preliminary report for pressure-gage connections will be acted upon. The principal dimensions specified in the report are the diameter and the threads per inch of the air connection at the back of the instrument. The report has been approved by pressure gage, as well as passenger car and motor truck manufacturers. The general adoption of the recommendation will make pressure gages interchangeable, as there is already a standard for the outside diameter of the instrument case and the location of the holding screws, when used.



# Some Timely Tips On Timers

*Ninety Per Cent of Timer Troubles Probably Due to Neglect—Essential to Keep Raceway Smooth—Misfiring at Low Speeds Generally Due to Weak Springs*

**I**F a person were told to divide a second into forty parts he would feel as if he were undertaking quite a job. And yet that is what the timer or commutator on the Ford engine has to do when the car is traveling at the rate of 30 m.p.h.

Forty times each second the small steel roller in the timer has to make perfect contact with the terminal point inserted in the raceway, or what usually is called the fibre ring.

No larger than the palm of your hand and tucked in between crankcase and radiator, it is probably the most neglected part on nine out of ten Fords. Few Ford owners clean and oil their timers often enough. Yet the little timer is no doubt the "biggest small part" of the car, and upon its proper performance largely depends the quality of service given by the engine.

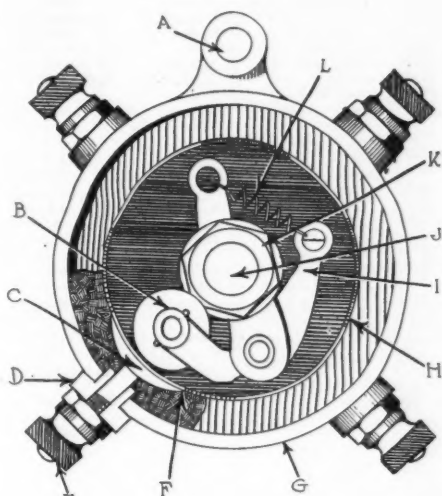
Fully 90 per cent of the trouble with the timer is due to neglect. Properly and regularly cared for, a good timer is an amazingly durable little instrument, functioning perfectly for thousands of miles, and finally giving due and fair warning before it calls for replacement.

Timer troubles are not hard to detect, although some mechanics often confuse them with carburetion difficulties. Hard starting, skipping, or misfiring when under load, popping and muffler explosions at high speed are the commonest symptoms of a defective timer.

The Ford timer has been so long an article of general use that a definite standard has resulted. This standard, of course, takes a midway course between the elaborate and complicated device and that made with a view to cheapness in price. Time has rather definitely defined the quality and price of this article, although there is still a wide field for differences of opinion among those who want to experiment, just as there is in the very old art of making stove dampers.

Generally speaking, timer troubles are remedied only by replacements, as it seldom pays to attempt to repair a timer which is so inexpensive to replace. In replacement, too much care cannot be exercised in the choice of the instrument purchased. The complicated types usually are as troublesome as the cheap, unbranded timers, but for a different reason. Quality of materials and simplicity of design are the prime requisites of a timer for the Ford, for it must be remembered that the average timer functions under disadvantageous conditions at all times—usually in a mess of dirt and grease.

If the instrument itself is good, most timer troubles can be avoided by peri-



View of the Ford timer with cover removed, showing at A, the control rod; B, roller; C, contact block; D, fibre washer; E, thumb nut; F, fibre; G, housing; H, fibre ring; I, roller arm; J, camshaft; L, spring

odical cleaning and oiling. On installation, a timer should be thoroughly flushed with light engine oil of good quality. It should be freely oiled thereafter every hundred miles or so. A good plan is to oil it once a week. Every 500 miles—or once a month—the timer shell should be lifted out, thoroughly cleaned with gasoline, then oiled and replaced.

If the timer is allowed to run dry, rapid wear of all moving parts naturally follows. It has also been found that a metallic ridge will form on raceway and roller which materially interferes with proper ignition. Failure to clean the instrument at intervals will cause it to become gummed up with old oil and dirt, which may either cause short-circuits between contact points and case, or so foul the points that electrical contact is entirely prevented.

Hard starting is caused either by a weak spring in the brush assembly or by the gumming up just referred to.

Misfiring at low speeds has the same causes as hard starting. At high speeds it is usually due to the raceway having become worn and wavy, so that the roller touches only parts of the contact or jumps some of them entirely. This misfiring at high speed is evidenced by repeated popping and explosions in the muffler.

Bumpy raceways in very cheap timers are often caused by water dripping on the timer from a leaky radiator hose overhead. This water swells the fiber

out of shape. The very cheap timers are also often subject to loose contact points, which often cause aggravated misfiring. In the finer instruments the contact points are anchored in machined grooves and cannot loosen.

The importance of the smooth, clean raceway and a correctly aligned and well oiled brush assembly can be appreciated when it is considered that the timer roller makes 2442 contacts per minute when the Ford travels 30 miles an hour. Yet each contact must thoroughly saturate a coil unit so that the low magneto current of less than 18 volts can be "stepped up" to the 5000-15,000 volt "juice" that fires the cylinders.

What should be the average life of a good timer? That is like asking the question, "How long should an automobile last?" With proper care, a good timer of standard design will give good service for 5000 miles or more. In fact, there are thousands of timers on Fords today which have been working for 15,000 or more miles. On the other hand, many of the "freak" design timers cannot be depended upon to give good service after 1000 or 2000 miles.

There is no place in the Ford engine where quality counts more than it does in the timer. It will pay the dealer to stock the best he can get, even though the buyer pays fifty or seventy-five cents more for it. And after he has bought the best, a few minutes of care, weekly, will keep it in prime condition, giving trouble-free ignition service for many thousands of miles.

## Increasing Power

The repairman is often asked by the car owner to do something to the car that will make it develop more power and have more get-up-and-go spirit. The general method is to rebore the cylinders, fitting in oversize pistons. The results are often more power, a big bill to the car owner, reduced gasoline mileage, a dissatisfied car owner and a lost customer for the service station.

A method of increasing the car's power without reboring is as follows: use an old valve seat reamer and grind it down until it is about 1/16 to 1/8 in. less in diameter. Then bore the port out with this reamer. The port opening is made larger by about 1/8 in.

This method does not decrease the gasoline mileage. The increased power results from the increased volumetric efficiency. The seat of the valve will not be damaged in any way, because the part bored out never is used. It is claimed by one man who tried this system he increased his power seven per cent.

## Specifications of Current Passenger Car Models

NAME AND MODEL	Engine Make	Cylinders, Bore and Stroke	WB	Tires	2-Pass.	5-Pass.	7-Pass.	Coupe	Sedan	NAME AND MODEL	Engine Make	Cylinders, Bore and Stroke	WB	Tires	2-Pass.	5-Pass.	7-Pass.	Coupe	Sedan
Ace.....G	Guy.	6-31x5	123	32x4	\$2075	\$2075	...	\$3680	\$3680	Maibohm.....B	Falls.	6-31x4 1/2	116	32x4	\$1395	\$1395	†1595	\$2295	\$2295
Ace.....H	H-S.	6-31x5	123	32x4	2975	2975	...	3680	3680	Marmion.....34	Ow.	6-31x5 1/2	136	32x4 1/2	4185	†3985	3985	4875	5275
Ace.....L	H-S.	4-31x5	116	32x4	2260	2260	...	...	...	Maxwell.....25	Ow.	4-31x4 1/2	109	30x3 1/2	845	845	1445	1545	
Allen.....Series 43	Ow.	4-31x5	110	32x4	1195	1195	...	1845	1845	McFarlan.....1921	Ow.	6-41x6	140	33x5	6300	†6300	6300	7500	7500
Ambassador.....R	Cont.	6-31x5 1/2	136	33x5	...	†4500	†4500	6500	6500	Mercer.....Series 5	Ow.	4-31x6 1/2	132	32x4 1/2	3950	†3950	*3950	4850	5250
American.....C	H-S.	6-31x5	127	32x4	2195	2195	†2350	3150	3150	Merit.....Cont.	Cont.	6-31x4 1/2	119	32x4	1985	1985	...	...	...
Anderson.....Series 40	Cont.	6-31x4 1/2	120	32x4	2195	1650	1795	2450	2550	Meteor.....R & RR	Dues.	4-41x6	129	32x4 1/2	5500	5500	...	...	...
Apperson.....8-21-S	Ow.	8-31x5	130	34x4 1/2	...	3000	3250	4500	4500	Metz.....M6	Rut.	6-31x5	120	32x4	1995	1995	...	2795	2895
Apperson.....Anniversary	Ow.	8-31x5	130	34x4 1/2	...	3500	3750	...	...	Muchell.....F-40	Ow.	6-31x5	120	32x4	...	†1790	...	...	...
Auburn.....6-51	Cont.	6-31x4 1/2	121	32x4	167	1695	1760	2475	2495	Mitchell.....F-40	Ow.	6-31x5	120	33x4	†1490	1490	...	...	...
										Mitchell.....F-42	Ow.	6-31x5	127	33x4	...	...	1795	...	...
										Mitchell.....F-45	Ow.	6-31x5	120	33x4	...	...	...	2290	2440
										Moller.....A	Ow.	4-21x4	100	27x3 1/2	2000	...	...	...	...
Beggs.....20T	Cont.	6-31x4 1/2	120	33x4	1775	1520	...	2320	2420	Monroe.....S-9 & 10	Ow.	4-31x4 1/2	115	32x3 1/2	1285	1295	...	...	...
Bell.....4-32	H-S.	4-31x5	114	31x4	...	1695	...	...	...	Monroe.....S-11 & 12	Ow.	4-31x4 1/2	115	32x4	1785	1785	2285	2785	2785
Bell.....6-50	H-S.	6-31x5	124	32x4	...	1695	...	...	...	Moon.....6-48	Cont.	6-31x4 1/2	122	32x4	...	2285	...	...	...
Biddle.....B1 & B5	Buda.	4-31x5 1/2	121	32x4	3475	3475	...	4790	...	Moon.....6-68	Cont.	6-31x5 1/2	125	32x4 1/2	...	2285	...	...	...
Birch Super-Four	H-S.	4-31x5	117	33x4	1195	1195	†1245	...	1795	Murray-Mac Six	Ow.	6-31x5 1/2	128	34x4 1/2	4250	4250	4250	...	...
Birch Light Six	Lelt.	4-31x4 1/2	108	30x3 1/2	995	995	...	...	...										
Birch Light Six	H-S.	6-31x5	117	33x4	1395	1395	†1445	...	1995										
Bour-Davis.....21S	Cont.	6-31x5 1/2	126	33x4 1/2	†2385	†2385	2385	...	...										
Brewster.....91	Ow.	4-41x5 1/2	125	32x4 1/2	17000	7000	...	10500	...										
Briscoe.....4-34	Ow.	4-31x5	109	31x4	1085	1085	...	1685	1685										
Buick.....1922-31-35-37	Ow.	4-31x4 1/2	109	31x4	935	975	...	1475	1650										
Buick.....1922-41-5-7	Ow.	6-31x4 1/2	118	33x4 1/2	1495	1525	...	2135	2435										
Buick.....1922-48-9-50	Ow.	6-31x4 1/2	124	34x4 1/2	...	...	1735	2325	2635										
Bush.....E.C.	Lye.	4-31x5	116	33x4	...	1195	...	...	...										
Bush.....E.C.	Rut.	6-31x5	116	33x4	...	1345	...	1750	1850										
Cadillac.....61	Ow.	8-31x5 1/2	132	33x5	3790	3790	3940	4340	4950										
Case.....V	Cont.	6-31x5 1/2	126	34x4 1/2	...	†2250	2250	2900	3285										
Chalmers.....6-30	Ow.	6-31x4 1/2	117	32x4	1495	1545	...	2295	2445										
Chalmers.....6-30	Ow.	6-31x4 1/2	122	33x4 1/2	...	...	1645	...	...										
Champion.....Tourist	Lye.	4-31x5	113	32x3 1/2	†1050	995	...	...	...										
Champion.....Special	H-S.	4-31x5	118	32x4	†1295	1295	...	...	...										
Chandler.....Six	Ow.	6-31x5	123	33x4	1785	†1785	1785	2785	2885										
Chevrolet.....490	Ow.	4-31x4	102	30x3 1/2	525	525	...	875	875										
Chevrolet.....490	Ow.	4-31x4	102	30x3 1/2	975	975	...	1575	1575										
Cleveland.....40	Ow.	6-31x4 1/2	112	32x4	1295	1295	...	2195	2295										
Climber Four	H-S.	4-31x5	115	33x4	1450	1385	...	...	...										
Climber Six	H-S.	6-31x5	125 1/2	32x4 1/2	2250	2250	...	3695	3995										
Cole.....870	Nort.	6-31x4 1/2	127	33x5	2550	†2695	2795	3695	3995										
Columbia Challenger	Rut.	6-31x5	115	32x4	...	1195	...	1995	1995										
Columbia.....D-C & C-S	Cont.	6-31x4 1/2	115	32x4	1475	1475	†1475	2295	2350										
Comet.....C-53	Cont.	6-31x5 1/2	125	33x4 1/2	...	2250	2450	3650	...										
Commonwealth.....44	H-S.	4-31x5	117	32x4	...	1375	...	2465	...										
Crow.....21-6-40	Cont.	6-31x5 1/2	122 1/2	32x4	3000	3000	3000	4500	...										
Crow-Elkhart.....L-63-65	Lye.	4-31x5 1/2	117	32x3 1/2	†1295	1295	...	...	...										
Crow-Elkhart.....S-63-65	H-S.	6-31x5	117	33x4	†1545	1545	...	...	...										
Daniels.....D-19	Ow.	8-31x5 1/2	132	34x4 1/2	†5350	†5350	5350	6250	6950										
Davis.....61-67	Cont.	6-31x4 1/2	120	32x4	†1895	1695	...	2795	2795										
Dispatch.....Wise	Ow.	4-31x5	120	34x4	1250	1350	1350	1525	1575										
Dixie Flyer.....H-S-70	H-S.	4-31x5	112	32x4	1445	1445	1945	2295	2345										
Dodge Brothers.....6-80	Ow.	4-31x5	114	32x4	935	985	...	1585	1785										
Dorris.....17-12	D-Ly.	4-31x5	108	31x4	985	985	...	1535	1685										
Dort.....17-12	D-Ly.	4-31x5	108	31x4	985	985	...	1535	1685										
Driggs.....A	Ow.	4-21x4 1/2	104	30x3 1/2	1275	1275	...	1975	...										
Du Pont.....A-22	Cont.	4-31x4 1/2	109	31x4	...	890	...	1365	1365										
Durant.....A-22	Cont.	4-31x4 1/2	109	31x4	...	890	...	1365	1365										
Elcar.....K-4	Lye.	4-31x5	117	33x4	†1145	1145	...	1545	1645										
Elcar.....K-4	R-Cont.	6-31x4 1/2	117	33x4	†1505	1505	†1595	2395	2495										
Elgin.....K-1	Falls.	6-31x4 1/2	118	33x4	1505	1495	†1595	2395	2395										
Essex.....S-5-21	Ow.	6-31x5	108 1/2	32x4	1375	1375	...	1890	2290										
Fergus.....S-5-21	Ow.	6-31x5	126	33x4 1/2	...	Chassi	Price	8500	...										
Ferris.....C-20	Cont.	6-31x5 1/2	130	32x4 1/2	2695	...	†2595	3695	...										
Ford.....T	Ow.	4-31x4	100	30x3 1/2	†325	†335	...	595	660										
Franklin.....9-B	Ow.	6-31x4	115	32x4	2300	2350	...	2650	3350										
Gardner.....G	Lye.	4-31x5	112	32x3 1/2	1995	995	...	1795	...										
Grant.....Six	Ow.	6-31x4 1/2	116	32x4	1550	1550	...	2450	2450										
H.C.S.....Weid.	4-31x5 1/2	120	32x4 1/2	2725	†2775	...	3450	3650	...										
Halladay, Manly, Special	Rut.	6-31x5	118	33x4	...	1595	...	...	...										
Halladay, Craft Special	Rut.	6-31x5	123	33x4	...	2195	...	...	...										
Handley-Knight.....60	Cont.	6-31x4 1/2	121	32x4	1795	1795	1995	†2775	2885										
Hanson Six.....42	H-S.	4-31x5	115	32x4	†1495	1495	...	2395	...										
Hartfield.....75	Ow.	6-31x5 1/2	132	34x4 1/2	2685	†2485	2485	3485	...										
Haynes.....55	Ow.	6-31x5	121	3x4	1835	1785	...	2835	...										
Haynes.....48	Ow.	12-21x5	132	34x4 1/2	4200	3635	3635	4950	...										
Holmes.....Series 4	Ow.	6-31x4 1/2	126	34x4 1/2	†2950	...	2950	3850	4150										
Hudson Super 6	Ow.	6-31x5	126	34x4 1/2	1895	...	1895	2770	2895										
Huffman.....R	Ow.	6-31x4 1/2	120	32x4	1845	1795	...	2795	...										
Hupmobile.....Series R	Ow.	6-31x4	112	32x4	1485	1485	...	2200	2250										
Jackson.....638	Cont.	6-31x4 1/2	121	32x4 1/2	†2285	1635	...	2985	2985</										



## Specifications of Current Motor Truck Models

NAME AND MODEL	Tons Capacity	Chassis Price	Bore and Stroke	TIRES	Final Drive	NAME AND MODEL	Tons Capacity	Chassis Price	Bore and Stroke	TIRES	Final Drive	NAME AND MODEL	Tons Capacity	Chassis Price	Bore and Stroke	TIRES	Final Drive			
				Front	Rear					Front	Rear					Front	Rear			
Acason	3/4	\$1650	3 1/2 x 5	34x5 1/2	34x5 1/2	W	Corbitt, A	3 1/2	\$4100	4 1/2 x 5 1/2	36x5	36x10	W	Gary, K	3 1/2	\$4050	4 1/2 x 6	36x5	40x5d	W
Acason, R	1	2260	3 1/2 x 5 1/2	36x5 1/2	36x5	W	Corbitt, AA	5	5000	4 1/2 x 6	36x6	40x6d	W	Gary, M	5	5150	4 1/2 x 6 1/2	36x6	40x6d	W
Acason, RB	1 1/2	2485	3 1/2 x 5 1/2	36x5 1/2	36x5	W	Day-Elder, A	1	2100	3 1/2 x 5	34x3 1/2	34x4	W	Gersix, M	1 1/2	3100	4 1/2 x 5 1/2	36x3 1/2	36x7	W
Acason, H	2 1/2	3295	4 1/2 x 5 1/2	36x5 1/2	36x5	W	Day-Elder, B	1 1/2	2300	3 1/2 x 5	34x3 1/2	34x5	W	Gersix, K	2 1/2	3500	4 1/2 x 5 1/2	36x4	36x8	W
Acason, L	3 1/2	4295	4 1/2 x 5 1/2	36x5 1/2	36x5	W	Day-Elder, C	2 1/2	2750	4 1/2 x 5 1/2	36x4	36x7	W	Gersix, 15-A	3 1/2	4500	4 1/2 x 6	36x5	40x12	W
Acason, M	5	5250	5 x 6 1/2	36x6	40x12	W	Day-Elder, D	2 1/2	3025	4 1/2 x 5 1/2	36x4	36x7	W	Giant, 16	1 1/2	2250	4 1/2 x 5 1/2	36x4	34x5 1/2	W
Ace, C	1 1/2	2295	3 1/2 x 5 1/2	34x3 1/2	34x5	W	Day-Elder, E	3 1/2	3750	4 1/2 x 5 1/2	36x5	36x5d	W	Giant, 17	2	3050	4 1/2 x 5 1/2	36x4	36x7	W
Ace, A	2 1/2	2795	4 1/2 x 5 1/2	36x5 1/2	36x7	W	Day-Elder, F	5	4250	4 1/2 x 6	36x5	40x6d	W	Golden West, GH	3 1/2	4150	4 1/2 x 5 1/2	36x5	36x5d	W
Acme, G	1 1/2	.....	3 1/2 x 5	35x5 1/2	35x5 1/2	W	Day-Elder, G	1	1700	3 1/2 x 5	34x3 1/2	34x5	W	Golden West, H	3 1/2	5000	4 1/2 x 6	36x6	36x6	W
Acme, B	1 1/2	.....	3 1/2 x 5	34x3 1/2	34x5	W	Dearborn, E	1 1/2	2300	3 1/2 x 5 1/2	34x4	34x5	W	Golden West, T	4	5500	4 1/2 x 6	36x6	36x6	W
Acme, F	1 1/2	.....	3 1/2 x 5	34x3 1/2	34x5	W	Dearborn, FX	2	2180	3 1/2 x 5 1/2	34x4	34x5	W	Golden West, K	7	6000	5 1/2 x 6	36x6	36x6	W
Acme, A	2	.....	4 1/2 x 5 1/2	36x5 1/2	36x7	W	Dearborn, 48	1	1995	3 1/2 x 5	35x5 1/2	35x5 1/2	W	Golden West, HA	7	6000	4 1/2 x 6	36x6	36x10	W
Acme, AC	2 1/2	.....	4 1/2 x 5 1/2	36x5 1/2	40x10	W	Defiance, D	1 1/2	2095	3 1/2 x 5	35x5 1/2	36x6	W	Graham Bros. A	1 1/2	2495	3 1/2 x 5	35x5 1/2	36x6	W
Acme, C	3 1/2	.....	4 1/2 x 5 1/2	36x5 1/2	40x12	W	Defiance, E	2	2275	3 1/2 x 5	35x5 1/2	38x7	W	Gramm-Bern, 10	1	1495	3 1/2 x 5	33x5 1/2	33x5 1/2	I
Acme, E	5	.....	4 1/2 x 6	36x6	40x12	W	DeKalb, E2 1/2	2	2600	4 1/2 x 5 1/2	36x4	36x5	W	Gramm-Bern, 15	1 1/2	2050	3 1/2 x 5	36x3 1/2	36x5	I
Akr' Multi-Trk20	1	1995	4 x 5 1/2	34x5	34x5	W	DeKalb, E2 1/2	2 1/2	2250	4 1/2 x 5 1/2	36x4	36x5	W	Gramm-Bern, 65	1 1/2	2725	3 1/2 x 5	36x3 1/2	36x5	W
American, 25	2 1/2	3350	4 x 6	36x4	36x4d	W	DeMartini, 1 1/2	1 1/2	2600	3 1/2 x 5	34x3 1/2	34x6	W	Gramm-Bern, 20	2	3175	4 1/2 x 5 1/2	36x4	36x7	W
American, 40	4	4275	4 1/2 x 6	36x5	36x5d	W	DeMartini, 2	2	3300	4 x 5 1/2	36x3 1/2	36x7	W	Gramm-Bern, 25	2 1/2	3575	4 1/2 x 5 1/2	36x4	36x4d	W
Apex, G	1 1/2	1450	3 1/2 x 5	33x5 1/2	33x5 1/2	I	DeMartini, 3	3	4250	4 1/2 x 5 1/2	36x4	36x10	W	Gramm-Bern, 35	3 1/2	4375	4 1/2 x 5 1/2	36x5	40x5d	W
Apex, D	1 1/2	1915	3 1/2 x 5 1/2	34x3 1/2	34x4	I	DeMartini, 4	4	4800	4 1/2 x 6	36x5	36x12	W	Gramm-Bern, 50	5	5275	4 1/2 x 6	36x6	40x6d	W
Apex, E	2 1/2	2695	4 1/2 x 5 1/2	36x4	36x7	I	Denby, 31	3 1/2	1625	3 1/2 x 5	35x5	35x5	B	Hahn, J4	1	.....	3 1/2 x 5	34x5	34x5	W
Apex, F	3 1/2	3975	4 1/2 x 6	36x5	36x10	I	Denby, 33	2 1/2	2300	3 1/2 x 5	35x5 1/2	38x7	I	Hahn, CD	1 1/2	.....	4 1/2 x 5 1/2	36x3 1/2	36x6	W
Armleder, 20	1	.....	3 1/2 x 5 1/2	34x3 1/2	34x5	W	Denby, 34	2	2600	3 1/2 x 5	36x3 1/2	36x6	I	Hahn, EE	2 1/2	.....	4 1/2 x 5 1/2	36x4	36x8	W
Armleder, HW	2 1/2	.....	4 1/2 x 5 1/2	36x5 1/2	36x7	W	Denby, 35	3	3300	4 1/2 x 5 1/2	36x4	36x7	I	Hahn, F	3 1/2	.....	4 1/2 x 5 1/2	36x5	36x10	W
Armleder, KW	3 1/2	.....	4 1/2 x 6	36x5	36x5d	W	Denby, 27	4	4200	4 1/2 x 5 1/2	36x5	36x5d	I	Hahn, EF	5	.....	4 1/2 x 6	36x6	40x12	W
Atco, B	1 1/2	.....	3 1/2 x 5 1/2	34x3 1/2	36x6	W	Denby, 28	5	4850	4 1/2 x 5 1/2	36x6	40x6d	I	Hal. Fur, E	1	2350	4 x 5	35x5 1/2	35x5 1/2	W
Atco, B1	1 1/2	.....	3 1/2 x 5 1/2	34x3 1/2	36x6	W	Dependable, A	1 1/2	1650	3 1/2 x 5	34x5	36x6	W	Hal. Fur, B	2 1/2	3250	4 1/2 x 5 1/2	35x5	38x7	W
Atco, A	2 1/2	.....	4 1/2 x 5 1/2	36x5 1/2	36x8	W	Dependable, C	2 1/2	2950	4 1/2 x 5 1/2	36x4	36x7	W	Hal. Fur, F	3 1/2	4250	4 1/2 x 5 1/2	36x6	40x10	W
Atlas, M.D.	1 1/2	1550	3 1/2 x 5	32x4 1/2	32x4 1/2	I	Dependable, D	3 1/2	3550	4 1/2 x 6	36x6	38x7	W	Hall	1 1/2	3100	3 1/2 x 5	34x5	38x7	W
Atterbury, 20R	1 1/2	2475	3 1/2 x 5	34x3 1/2	34x5	W	Dependable, E	1	2500	3 1/2 x 5	34x5 1/2	36x6	W	Hall	2 1/2	3275	4 1/2 x 5 1/2	36x5	36x6	W
Atterbury, 7CX	2 1/2	3175	4 1/2 x 5 1/2	36x4	36x4d	W	Diamond T, O	1 1/2	2960	3 1/2 x 5 1/2	36x3 1/2	36x5	W	Hall	3 1/2	4100	4 1/2 x 5 1/2	36x5	36x5d	W
Atterbury, 7D	3 1/2	3975	4 1/2 x 5 1/2	36x5	40x5d	W	Diamond T, FS	1 1/2	2650	3 1/2 x 5 1/2	36x3 1/2	36x5	W	Hall	5	5100	4 1/2 x 5 1/2	36x5	40x6d	W
Atterbury, 8E	5	5125	4 1/2 x 6	36x5	40x6d	W	Diamond T, T	2	3285	4 x 5 1/2	36x4	36x7	W	Hall	7	5100	4 1/2 x 5 1/2	36x5	40x6d	C
Autocar, 21UF	1 1/2-2	2300	4 1/2 x 5 1/2	34x4	34x5	D	Diamond T, U	3 1/2	4675	4 1/2 x 5 1/2	36x5	36x5d	W	Harvey, WEA	2	2550	4 1/2 x 5 1/2	34x3 1/2	34x5	W
Autocar, 21G	1 1/2-2	2400	4 1/2 x 5 1/2	34x4	34x5	D	Diamond T, EL	5	5400	4 1/2 x 5 1/2	36x6	40x6d	W	Harvey, WFA	2 1/2	2950	4 1/2 x 5 1/2	36x4	36x7	W
Autocar, 26B	1 1/2	4500	4 1/2 x 5 1/2	36x6	36x12	D	Diehl, A	1	.....	3 1/2 x 5	34x4 1/2	35x5	I	Harvey, WKA	3 1/2	3950	4 1/2 x 6	36x5	36x5d	W
Available, H1 1/2	1 1/2	2175	4 x 5 1/2	36x3 1/2	36x5	W	Diehl, B	1 1/2	1350	3 1/2 x 5	34x4 1/2	35x5	I	Hawkeye, K	1 1/2	1850	3 1/2 x 5 1/2	34x3 1/2	34x5	I
Available, H2	2 1/2	2775	4 x 5 1/2	36x3 1/2	36x6	W	Dispatch, F	2 1/2	4100	4 1/2 x 5 1/2	36x5	36x7	C	Hawkeye, M	2	2650	4 1/2 x 5 1/2	36x4	36x6	I
Available, H2 1/2	2 1/2	3475	4 x 5 1/2	36x3 1/2	36x8	W	Doane	3 1/2	5100	4 1/2 x 5 1/2	36x5	36x5d	C	Hawkeye, N	3 1/2	3700	4 1/2 x 6	36x5	36x10	W
Available, H3	3 1/2	4475	4 1/2 x 5 1/2	36x5	40x5d	W	Dodge Brothers	1 1/2	885	3 1/2 x 5	33x4 1/2	33x4 1/2	B	Hendrickson, N	2 1/2	3150	4 1/2 x 5 1/2	36x4	36x7	I
Available, H3 1/2	5	5375	4 1/2 x 6	36x6	40x12	W	Dorris, K-4	2 1/2	3400	4 1/2 x 5 1/2	36x4	36x7	W	Hendrickson, M	3 1/2	3975	4 1/2 x 5 1/2	36x5	36x5d	W
Available, H7	7	6000	5 x 6	36x6	40x14	B	Dorris, K-7	3 1/2	4400	4 1/2 x 5 1/2	36x5	36x10	W	Huffman, B	1 1/2	1995	3 1/2 x 5	34x3 1/2	34x6	W
Available, H7	1	.....	3 x 4	34x5 1/2	34x5 1/2	I	Double Drive B	3 1/2	4000	4 1/2 x 5 1/2	36x5	36x10	W	Huffman, C	1 1/2	1795	3 1/2 x 5 1/2	34x3 1/2	34x6	I
Beck, A Jr.	1	1950	3 1/2 x 5	34x3 1/2	34x4	I	Douglas G	1 1/2	2050	3 1/2 x 5	36x5	37x8	W	Hurlburt	1 1/2	.....	4 1/2 x 5 1/2	36x4	34x5	W
Beck, C	2	2550	4 1/2 x 5 1/2	36x4	36x6	I	Douglas I	3	3250	4 1/2 x 5 1/2	36x6	37x8	W	Hurlburt	2 1/2	.....	4 1/2 x 5 1/2	36x4	36x4d	W
Bell, M	1 1/2	1495	3 1/2 x 5 1/2	36x5	35x5 1/2	W	Duplex, A	1 1/2	2775	4 x 5 1/2	35x5 1/2	38x7	W	Hurlburt	3 1/2	.....	4 1/2 x 6	36x5	36x5d	W
Bell, E	1	2100	3 1/2 x 5 1/2	34x3 1/2	34x5 1/2	W	Duplex, E	3 1/2	4250	4 1/2 x 5 1/2	36x6	36x8	I	Hurlburt	5	.....	4 1/2 x 6	36x5	40x6d	W
Bell, O	2 1/2	2550	4 1/2 x 5 1/2	36x4	36x6	W	Duty, 21	2	1490	3 1/2 x 5	34x3 1/2	34x5	I	Indep't (Iowa), B	1	1665	3 1/2 x 5	34x3 1/2	34x4	W
Belmont, D	2	2675	3 1/2 x 5	34x3 1/2	34x6	D	Eagle, 100-2	2	2275	3 1/2 x 5 1/2	34x4	34x7	I	Indep't (Iowa), G	1 1/2	2040	3 1/2 x 5 1/2	34x3 1/2	34x5	I
Belmont, F	3 1/2	3525	4 x 6	36x5	36x5d	D	Erie, E	1 1/2	.....	3 1/2 x 5 1/2	36x6	36x7	W	Indep't (Ia.), H.I.	2 1/2	2940	4 1/2 x 5 1/2	34x4	34x6	W
Bessemer, G	1	1395	3 1/2 x 5	35x5 1/2	35x5 1/2	I	Erie, A	2 1/2	.....	4 1/2 x 5 1/2	36x6	36x4d	W	Indep't (Ohio), F	1 1/2	2585	3 1/2 x 5	36x3 1/2	36x5	W
Bessemer, H-2	1 1/2	1995	3 1/2 x 5	36x3 1/2	36x5	I	F.W.D., B	3	4200	4 1/2 x 5 1/2	36x6	36x6	B	Indep't (Ohio), K	3 1/2	3985	4 1/2 x 5 1/2	36x5	36x5d	W
Bessemer, J-2	2 1/2	2595	4 1/2 x 5 1/2	36x5 1/2	36x4d	I	Facto, 1921	2 1/2	2895	4 1/2 x 5 1/2	36x4	36x4	W	Indiana, 12	1 1/2	2290	3 1/2 x 5	34x3 1/2	34x5	W
Bessemer, K-2	2 1/2	3495	4 1/2 x 5 1/2	36x5	36x10	I	Fagel, 1 1/2	1 1/2	3000	3 1/2 x 5 1/2	34x3 1/2	34x5	W	Indiana, 20	2	2950	4 1/2 x 5 1/2	36x4	36x7	W
Brinton, F	4 1/2	3400	4 1/2 x 5 1/2	36x4	36x7	W	Fagel, 2 1/2	2 1/2	3900	4 1/2 x 5 1/2	36x4	36x7	W	Indiana, 25	2 1/2	3150	4 1/2 x 5 1/2	36x4	36x8	W
Brockway, E	1 1/2	1675	3 1/2 x 5 1/2	35x5 1/2	35x5 1/2	B	Fagel, 3 1/2	3 1/2	5000	4 1/2 x 5 1/2	36x5	40x5d	W	Indiana, 35	3 1/2	3750	4 1/2 x 5 1/2	36x5	36x5d	W
Brockway, S-4	1 1/2	2250	3 1/2 x 5	36x3 1/2	36x5	W	Fargo, R	2	2500	3 1/2 x 5	36x4	36x6	I	I-diana, 51	5	4795	5 x 6 1/2	36x5		

NAME AND MODEL										Tons Capacity	Chassis Price	Bore and Stroke	TIRES		Final Drive	NAME AND MODEL										Tons Capacity	Chassis Price	Bore and Stroke	TIRES		Final Drive
													Front	Rear															Front	Rear	
Kelly-S, K-45	4	\$1550	4 1/2 x 6 1/8	36x5	40x6d	C	O. K., K1	1 1/2	\$2675	4 x 5 1/2	36x3 1/2	36x5	W	Southern, 15	1 1/2	\$2590	3 1/2 x 5 1/2	36x6 1/2	34x4	W											
Kelly-S, K-50	5	4900	4 1/2 x 6 1/8	36x6	40x6d	C	O. K., L1	2 1/2	3450	4 1/2 x 5 1/2	36x4	36x8	W	Southern, 20	2	2990	4 1/2 x 5 1/2	36x6 1/2	40x8*	W											
Kelly-S, K-60	6	5100	4 1/2 x 6 1/8	36x6	40x7d	C	O. K., M1	2 1/2	4250	4 1/2 x 6	36x5	36x5d	W	Standard, 1-K	1-1 1/2	1800	3 1/2 x 5 1/2	34x3 1/2	34x5*	W											
Keynote, 40	2 1/2	2150	3 1/2 x 5 1/2	34x5 1/2	38x7 1/2	W	Ogden, A1	1 1/2	2550	3 1/2 x 5 1/2	36x3 1/2	36x5	W	Standard, 76	2 1/2	2000	3 1/2 x 5 1/2	36x4	36x7*	W											
Kimball, AB	2 1/2	3675	4 x 6	36x4	36x7	W	Ogden, E	1 1/2	3250	4 1/2 x 6	36x4	36x7	W	Standard, 66	3 1/2	2800	4 1/2 x 6	36x5	36x10	W											
Kimball, AC	3	3975	4 1/2 x 6	36x4	36x10	W	Old Hickory, W	1 1/2	2175	3 1/2 x 5 1/2	36x3 1/2	36x4*	W	Standard, 5-K	1 1/2	2500	4 1/2 x 6	36x5	40x12	W											
Kimball, AK	3	4500	4 1/2 x 6	36x4	36x10	W	Old Reliable, A	1 1/2	2350	4 x 5	34x4	36x6	W	Sterling, 1 1/2	1 1/2	4300	4 x 5 1/2	36x3 1/2	36x5*	W											
Kimball, AE	4	5000	4 1/2 x 6	36x5	40x12	W	Old Reliable, B	2 1/2	3500	4 1/2 x 6	36x4	36x4d	W	Sterling, 2	2	3500	4 x 5 1/2	36x4	36x6	W											
Kimball, AF	5	5975	5 x 6	36x6	40x7d	W	Old Reliable, C	3 1/2	4250	4 1/2 x 6	36x5	36x5d	W	Sterling, 2 1/2	2 1/2	3650	4 1/2 x 6 1/2	36x4*	36x4d*	W											
Kissel, Express	1 1/2	1975	3 1/2 x 5 1/2	34x5 1/2	34x5 1/2	W	Old Reliable, D	5	5250	4 1/2 x 6	36x6	40x6d	W	Sterling, 3 1/2	3 1/2	4650	4 1/2 x 6 1/2	36x5*	40x5d*	W											
Kissel, Utility	2 1/2	2375	4 1/2 x 5 1/2	36x5	36x5	W	Old Reliable, E	7	6000	4 1/2 x 6 1/2	36x6	40x7d	C	Sterling, 5-W	5	5500	5 x 6 1/2	36x6	40x6d	W											
Kissel, Freight	2 1/2	2775	4 1/2 x 5 1/2	36x5	36x7	W	Olympic, A	1 1/2	1095	3 1/2 x 5 1/2	35x5 1/2	35x5 1/2	I	Sterling, 5-C	1 1/2	6000	5 x 6 1/2	36x6	40x6d	W											
Kissel, H. D.	4	3675	4 1/2 x 5 1/2	36x5	36x5d	W	Olympic, B	2	3500	4 1/2 x 5 1/2	36x4	36x7	W	Sterling, 7	2	6500	5 x 6 1/2	36x6	40x7d	W											
Kleiber, AA	1 1/2	2600	4 1/2 x 5 1/2	36x5	36x5*	W	Oshkosh, A	2	3750	3 1/2 x 5	36x6 1/2	36x6 1/2	4	Stewart, 14	1 1/2	1875	3 1/2 x 5	35x5 1/2	35x5 1/2	W											
Kleiber, AB	1 1/2	3100	4 1/2 x 5 1/2	36x5	36x5*	W	Oshkosh, AA	2 1/2	3850	3 1/2 x 5	36x6 1/2	36x6 1/2	4	Stewart, 15	2	2200	3 1/2 x 5	35x5 1/2	35x5 1/2	W											
Kleiber, BB	2 1/2	3600	4 1/2 x 5 1/2	36x5	36x5*	W	Oshkosh, B	2 1/2	4150	4 x 5 1/2	38x7 1/2	38x7 1/2	4	Stewart, 7	2 1/2	2800	4 1/2 x 5 1/2	34x4	34x7	W											
Kleiber, C	3 1/2	3950	4 1/2 x 5 1/2	36x5	36x5d	W	Oshkosh, BB	2 1/2	4300	4 x 5 1/2	38x7 1/2	38x7 1/2	4	Stewart, 7-X	3 1/2	3850	4 1/2 x 5 1/2	36x5	36x5d	W											
Kleiber, D	5	5300	5 x 6 1/2	36x6	40x12	W	Packard, EC	...	3500	4 1/2 x 5 1/2	36x4	36x7	W	Stewart, 10-X	3 1/2	3850	4 1/2 x 5 1/2	36x5	36x5d	W											
Koehler, D	1 1/2	1885	3 1/2 x 5	34x5	34x5</																										

1—Nelson Le Moon. 2—Four-Wheel Drive.



## Specifications of Current Motor Truck Models—Continued

NAME AND MODEL	Tons Capacity	Chassis Price	Bore and Stroke	TIRES		Final Drive	NAME AND MODEL	Tons Capacity	Chassis Price	Bore and Stroke	TIRES		Final Drive	NAME AND MODEL	Tons Capacity	Chassis Price	Bore and Stroke	TIRES		Final Drive
				Front	Rear						Front	Rear						Front	Rear	
Watson, E	1	\$1865	3 1/2 x 5 1/2	35x5 1/2	35x5 1/2	W	Wichita, S	5	\$5000	4 1/2 x 6	36x6	40x6d	W	Winther, 39	1 1/2	\$2450	3 1/2 x 5	34x3 1/2	34x5	I
Watson, N	3 1/2	4250	4 1/2 x 5 1/2	36x5	36x10	W	Wilcox, AA	1	2100	3 1/2 x 5 1/2	36x4	36x4	W	Winther, 49	2	3250	4 x 5	34x4	34x4d	I
Western, W1 1/2	1 1/2	2550	4 1/2 x 5 1/2	36x3 1/2	36x5	W	Wilcox, B	1 1/2	2775	4 1/2 x 5	36x4	36x5	W	Winther, 50	2 1/2	3995	4 x 6	38x7 1/2	42x9 1/2	I
Western, L1 1/2	1 1/2	2550	3 1/2 x 5	36x3 1/2	36x5	W	Wilcox, D	2 1/2	3300	4 1/2 x 5	36x4	36x3 1/2	W	Winther, 70	3 1/2	4200	4 x 6	36x5	36x5d	I
Western, W2 1/2	2 1/2	3250	4 1/2 x 5 1/2	36x4	36x7	W	Wilcox, E	3 1/2	4250	4 1/2 x 6	36x5	36x5d	W	Winther, 450	2 1/2	3690	4 x 5	34x5	36x6	I
Western, L2 1/2	2 1/2	3250	4 1/2 x 6	36x4	36x7	W	Wilcox, F	5	5200	4 1/2 x 6 1/2	36x5	40x6d	W	Winther, 109	5	5250	4 1/2 x 6	36x6	40x5d	I
Western, W3 1/2	3 1/2	4250	4 1/2 x 6	36x5	40x5d	W	Wilson, EA	1 1/2	2270	3 1/2 x 5	36x3 1/2	36x5	W	Winther, 140	7	5900	5 x 6	36x6	40x7d	I
White, 15	1	2400	3 1/2 x 5 1/2	34x5 1/2	34x5 1/2	B	Wilson, F	1 1/2	2825	4 1/2 x 5 1/2	36x4	36x7	W	Wisconsin, B	1	1950	4 x 5 1/2	34x5 1/2	34x5 1/2	W
White, 20	2	3250	3 1/2 x 5 1/2	36x4	36x7	D	Wilson, G	2 1/2	3685	4 1/2 x 5 1/2	36x5	36x5d	W	Wisconsin, C	1 1/2	2500	4 1/2 x 5 1/2	36x6 1/2	36x6 1/2	W
White, 40	3 1/2	4200	3 1/2 x 5 1/2	36x5	40x5d	D	Wilson, H	5	4520	4 1/2 x 6	36x6	40x6d	W	Wisconsin, D	2 1/2	3500	4 1/2 x 6 1/2	36x6	36x10	W
White, 45	5	4500	4 1/2 x 5 1/2	36x6	40x6d	D	Winther, 751	1	1795	3 1/2 x 5	34x4 1/2	35x5 1/2	I	Wisconsin, E	3 1/2	4000	5 x 6 1/2	36x6 1/2	36x12 1/2	W
White Hick., E	1	1225	3 1/2 x 5	34x5 1/2	34x5 1/2	W	Winther, 430	1 1/2	2850	3 1/2 x 5	32x4	32x4	I	Witt-Will, N	1 1/2	2750	3 1/2 x 5	36x3 1/2	36x5	W
White Hick., H	1 1/2	1375	3 1/2 x 5	36x3 1/2	36x5	W	*2-cyl. †6-cyl. ‡8-cyl. All others, not marked, are 4-cyl.													
White Hick., K	2 1/2	1675	4 1/2 x 5 1/2	36x4	36x5	W	Trac., Tractor. **Canadian made.													
Wichita, K	1	2300	3 1/2 x 5 1/2	36x3	36x4	W	Final Drive: W—Worm, I—Internal Gear, C—Chains, D—													
Wichita, L	1 1/2	2600	3 1/2 x 5 1/2	36x3 1/2	36x5	W	Double Reduction, B—Bevel, 4—Four-Wheel, E—External													
Wichita, M	2	2800	3 1/2 x 5 1/2	36x3 1/2	36x6	W	Gear. *Tires—optional. †Pneumatic Tires. All others solid.													
Wichita, R	2 1/2	3000	3 1/2 x 5 1/2	36x4	36x7	W	‡Price includes body. §—Price includes several items of													
Wichita, RX	2 1/2	3600	4 1/2 x 6	36x4	36x8	W	equipment.													
Wichita, O	3 1/2	4000	4 1/2 x 6	36x5	36x5d	W														

## MANUFACTURERS AT LAST SEE THE USED CAR AS THEIR PROBLEM

(Continued from page 19)

C. C. committee was authorized to hold another session with the N. A. D. A. representatives. This meeting will be held next week in Detroit.

Some of the contract changes proposed by the dealers probably will be accepted by the manufacturers but not all of them. No matter what recommendations are made by the N. A. C. C. committee, it will be impossible to carry them into effect except through their acceptance by each individual manufacturer. There is a general feeling on the part of the vehicle builders that some of the unsatisfactory conditions which existed when the two committees were appointed already have righted themselves and that these readjustments will continue automatically. The manufacturers assert that the attitude

taken by factory sales managers is less arbitrary than in the past and that relations with dealers will become increasingly close in the future.

There was apparent, in fact, a determination on the part of the manufacturers to maintain a closer contact with their dealers.

Truck manufacturers, at a meeting took up the problems of their dealers in much the same fashion as the passenger car makers. J. H. Shale, vice-president of the Bankers Commercial Security Corp., and Curtis C. Cooper, president of the General Motors Acceptance Corp., addressed the members, outlining the changing attitude of bankers towards motor truck paper. Both made suggestions in regard to dealer financing and the stocking of cars for the winter.

## AWARD BUICK FIRST CHOICE IN NEW YORK, CHICAGO SHOWS

(Continued from page 22)

82 will be shown in Chicago. Only two foreign cars will be shown at New York. They are the Itala and the Vauxhall. The American cars which will be shown in New York but to which space has not yet been assigned, are: Hatfield, Bournonville, Essex, Rickenbacker and Kelsey. The Rickenbacker probably will be displayed at Chicago also.

The result of the drawing follows:

Note: In Chicago letter X after space means Coliseum or Annex; letter Y means Armory. In New York Show the A spaces are on first floor, B spaces on second, C on third and D on fourth.

"Not" means "not showing" or "space not available."

\*Means "non-member of N. A. C. C."

New York	Car Name	Space
A-19	Buick	C-5-X
A-11	Dodge	D-1-X
A-15	Studebaker	B-2-X
A-20	Cadillac	A-6-X
A-12	Willys-Overland	C-3-X
A-16	Chevrolet	A-4-X
A-30	Nash	C-1-X
A-14	Hudson	D-3-X
A-13	Olds	C-6-X
A-26	Franklin	B-6-X
A-17	Oakland	A-2-X
A-4	Paige	D-5-X
A-27	Chandler	B-4-X
A-31	Hupp	B-5-X
A-6	Packard	D-2-X
A-3	Reo	C-2-X
A-10	Dort	A-1-X
A-32	Cleveland	D-6-X
A-21	Marmon	F-4-X
A-22	Peerless	D-4-X
A-23	Pierce-Arrow	C-4-X
A-7	Haynes	F-3-X
A-25	Velle	K-1-X
A-8	Lincoln	A-3-X
A-18	Lexington	B-2-X
A-9	Maxwell	E-2-X

A-6	Jordan	F-5-X
A-24	Auburn	E-1-X
B-27	Stephens	F-1-X
B-26	Stearns	H-1-X
A-2	Chalmers	A-5-X
A-29	Gardner	B-1-X
B-28	Stutz	O-2-X
A-1	Cole	G-1-X
B-24	Locomobile	H-2-X
B-9	Moon	E-4-X
B-29	Liberty	G-2-X
B-25	Briscoe	O-1-X
B-23	Mitchell	P-1-X
B-30	Elgin	J-1-X
B-12	Grant	N-1-X
B-2	Mercer	M-1-X
B-8	Lafayette	E-3-X
B-4	Case	A-1-Y
B-16	National	F-2-X
B-10	H. C. S.	M-2-X
A-28	Apperson	Q-1-X
B-3	Barley (Roamer)	B-2-Y
B-18	Westcott	Q-2-X
B-17	Kissel	Q-3-X
B-31	Templar	A-4-Y
B-1	Columbia	B-1-Y
B-13	Holmes	B-3-Y
B-14	Elkhart	Q-4-X
B-15	Davis	A-3-Y
B-22	Premier	A-2-Y
B-7	Standard Steel	A-8-Y
B-21	Crow	A-7-Y
B-20	R & V	A-6-Y
B-11	McFarlan	B-7-Y
C-3	Saxon	E-2-Y
B-19	King	B-5-Y
C-20	Malbohm	E-1-Y
C-13	Anderson	C-1-Y
C-4	Jackson	A-5-Y
C-19	Dorris	B-8-Y
C-14	Dixie Flyer (Ky.)	B-4-Y
B-5	Sayers	B-6-Y
C-6	Milburn	E-4-Y
C-18	Detroit Electric	E-6-Y
C-7	Paterson	C-3-Y
C-2	Pilot	E-3-Y
C-15	Stevens-Duryea	E-5-Y
C-21	Wm. Small	C-2-Y
C-8	(Monroe)	C-5-Y
C-11	Hanson	Not
C-13	DuPont	Not
C-9	Commonwealth	C-4-Y
C-1	Kline	Not
C-10	Rauch & Long	C-6-Y
C-17	Durant	D-1-Y
C-16	Handley-Knight	L-1-X
C-10	Wills-St. Claire	D-2-Y
C-22	Ambassador	Not
C-17	*Stanley	Not
D-1	*Noma	Not
	*Leach	Not

## OPENS AUTOMOBILE LIVERY

Knoxville, Tenn., Oct. 9—The automobile livery plan has been put into effect at Knoxville, Tenn., known as the "U-Drive-It" system. The plan is designed particularly for commercial travelers.

Two business references and a deposit of \$10 are required before a car will be permitted to leave the garage. This is done to lessen possibility of theft and reckless driving. A questionnaire is also filled out to further identify the applicant for a car.

Sixteen cents a mile is the basic charge, with a graduated scale of charges to cover gasoline, oil, insurance and depreciation. This charge averages about 4 1/2 cents a mile.

## SHOW ATTENDANCE COMPULSORY

Chicago, Oct. 8—When the Automobile Accessory Show opens at the Coliseum here Nov. 14 to 19, in connection with the annual convention of the Automotive Equipment Assn., all available space will have been subscribed and a splendid exhibition assured. This year attendance at the show for the afternoons of at least two days will be compulsory on the part of delegates to the convention.

## TO SELL COTTA TRANSMISSION

Rockford, Ill., Oct. 9—Trustees of the Cotta Transmission Co., which has been operated under a receivership for several months, are suggesting to creditors that the plant be closed and bids asked for sale of assets remaining. Sanction of the referee in bankruptcy will be sought to this proposal, the factory continuing in operation in the meantime.

# COMING MOTOR EVENTS

## AUTOMOBILE SHOWS

Flushing, N. Y.	Queen's County Automobile Show	Oct. 10-15
Atlanta	Fall Automobile Show	Oct. 13-23
Pittsburgh	Automotive Association Fall Show	Oct. 15-22
St. Louis	Automobile Exposition	Oct. 15-22
Birmingham	Annual Automobile Show	Oct. 24-29
Little Rock, Ark.	Little Rock Automobile Dealers' Assn.	Nov. 11-19
Jersey City	Second Annual Show	Nov. 14-19
Chicago	Automotive Equipment Show	Nov. 14-19
New York	Automobile Salon	Nov. 27-Dec. 3
New York	National Automobile Show	Jan. 7-13
Buffalo	Buffalo Automobile Dealers' Assn.	Jan. 14-21
Cleveland	Cleveland Automobile Mfrs. and Dealers' Assn.	Jan. 21-28
Oakland, Calif.	Automobile Show	Jan. 16-22
Chicago	National Automobile Show	Jan. 28-Feb. 3
Chicago	Automobile Salon	Jan. 28-Feb. 3
Minneapolis	Tractor Show	Feb. 6-11
Minneapolis	Automobile Show	Feb. 6-11
Winnipeg, Canada	Canadian Automotive Equipment Assn. Show	Feb. 6-11
Kansas City	Kansas City Motor Car Dealers' Assn.	Feb. 9-16
Atlanta	Southern Automobile Show	Feb. 11-18
Louisville, Ky.	Fourteenth Annual Automobile Show	Feb. 20-25
Des Moines	Winter Automobile Show	Feb. 26-March 3
Brooklyn	Eleventh Annual Show	March 4-11
Newark, N. J.	Newark Automobile Dealers' Assn.	March 11-18

## RACES

Los Angeles	Speedway Race	Nov. 24
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## FOREIGN SHOWS

Paris, France	Paris Motor Show	Oct. 5-16
Olympia, England	Automobile Show	Nov. 3-12
London	British Motor Show, Motor Mfgs. and Traders	Nov. 4-11
Paris	Aviation Exhibition	Nov. 12-27
Santiago, Cuba	Annual Automobile Show	March, 1922
Rio de Janeiro, Brazil	Automotive Exhibition	September, 1922

## CONVENTIONS

Chicago	Twenty-eighth Annual Convention National Implement & Vehicle Association	Oct. 12-14
Oakland, Calif.	International Traffic Officers' Assn.	Oct. 24-29
Omaha	International Automobile Congress	Nov. 3-5
Cleveland	National Tire Dealers' Association	November
Chicago	Annual Meeting and Business Exhibits of Automotive Equipment Assn.	Nov. 14-19
New York	Service Managers' Convention	Nov. 15-16
Columbus, O.	Ohio Automotive Trade Assn. Meeting	Dec. 12, 14
Chicago	American Road Builders' Convention and Show	Jan. 17-20

## FRICITION DRIVE ENGINEERS

Newark, N. J., Oct. 8—Realizing the importance of cooperation in the development of friction drive, now becoming a recognized factor in many industries, a number of prominent engineers interested in the subject met here Sept. 29 and formed the Friction Drive Engineering Society. Permanent organization will be organized at a meeting in Indianapolis, Nov. 3. Temporary officers were elected as follows: president, C. A. S. Howlett, of Divine Brothers Co., Utica, N. Y.; vice-president, W. D. Hamerstadt, of the Rockwood Mfg. Co., Indianapolis; secretary and treasurer, C. W. Kelsey, of the Kelsey Motor Co., Newark, N. J.

## ESTABLISH NEW CREDIT SYSTEM

Baltimore, Oct. 7—Black & Decker Mfg. Co., manufacturer of electric motor-driven shop equipment, has recently placed in operation a credit service in which the company goes 50-50 with the jobber. It is claimed that this system will solve the sales problems of the com-

pany, as it will enable delivery of great quantities of equipment on which inquiries have been made, but which could not be shipped because of the inability of the customer to finance himself. In the plan a time limit of six months is given for the amount of the selling price less the minimum cash payment of 23 per cent. In cases of loss, and they are said to be not more than one per cent, the company shares the loss equally with the jobber.

## REVERE PRICES DROP

Logansport, Ind., Oct. 8—New prices have been announced by the Revere Motor Car Co., as follows:

	Old Price	New Price
Roadster	\$4,850	\$3,850
5-passenger touring	4,650	3,850
4-passenger touring	4,650	3,050
Sedan	6,500	4,500

## VELIE REDUCES AGAIN

Moline, Ill., Oct. 8—Velie Motors Corp. has made a reduction in price on two of its models. The prices are:

	Old	New
Model 34 touring	\$1385	\$1235
Model 34 roadster	1385	1235

## PREPARE FOR COLUMBUS MEET

Columbus, O., Oct. 8—Secretary Shover of the Ohio Automobile Trade Assn. appeared before the Columbus Automobile Assn. at its weekly luncheon to explain the forthcoming annual meeting of the former organization which will be held in Columbus in December.

## COURT DENIES RECEIVER

Toledo, Oct. 7—Application for a receiver for the Automotive Corporation of this city which was filed by E. E. Hallet, a small stockholder, has been dismissed by Federal Judge Westenhaver. The company has been given a clean bill of health. Hallet alleged in his complaint that misrepresentations were made to induce the purchase of stock.

## Franklin District Sales Managers at Conference



Group of Franklin district sales managers, 18 in number, who attended conference at the factory, Syracuse, N. Y. A. G. Maney, factory director of distribution, is third from the left in back row; S. E. Ackerman, sales manager, is second from left in back row and H. H. Goodhart is fifth from the left in front row